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Regional Differentials In The Impact of Socio-economic Variables On Fertility Egypt, 1980 – 2000

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CHAPTER I

Introduction

That rapid population growth hinders social and economic development efforts in Egypt has been sufficiently acknowledged. Thus, the government has given utmost priority to bringing down the rate of population growth through mainly reducing fertility.

During the last decade, much of the discussion of women's position in society has been centered around the relationship between men and women and development. The concern of the international community and scholars has been on how development affects women.

The answer to this question varies from pessimistic views about the exclusion of women from development programs and the adverse effect of development on women to optimistic issues raised about the beneficial effect of conscious developmental programs that could be designed for the inclusion of women in development, (Nawar, 1984).

The population policy in Egypt seeks to reduce population growth through family planning programs and improvement of population characteristics, particularly those related to women's education and participation in the labor force. So fertility analysis and family planning determinants are important subjects to be dealt with, (Mohamed, 1993).

The speed of change in fertility level varied substantially by region of residence (Urban governorates of Egypt (UG); Urban Lower Egypt (UL); Urban Upper Egypt (UU); Rural Lower Egypt (RL); Rural Upper Egypt (RU). The highest percent of reduction in fertility level was in RL, where TFR fell from 4.7 live births in 1988 to about 3.3 in 2000. The least percent of reduction reported in RU, where TFR decreased from 6.2 live births in 1988 to about 4.7 in 2000. In 2000, the lowest TFR was observed in the UG. It reached about 2.9 live births.

There are factors that influence fertility directly and factors that influence fertility indirectly. Building on the work of Davis and Black (1956), Bongaarts (1978; 1980) classified the factors that influence fertility directly, which he termed the proximate determinants of fertility. Bongaarts found that empirically the four most important proximate determinants are:

1- Proportion married among females

2- Contraceptive use and effectiveness
3- Induced abortion
4- Duration of postpartum infecundability (because of breastfeeding or sexual abstinence following childbirth). Other less important proximate determinants are permanent sterility, spontaneous intrauterine mortality and natural fecundability.

1.1 Objectives of the study:

In view of the previous introduction, the following specific objectives are worth considering:-

1- To study the regional differentials in the net effect of socioeconomic variables on some proximate determinants of fertility.

2- To identify the regional differentials of the impact of proximate variables on fertility.

1.2 Data Sources:-

The two sources of data in this study are:-

1- 1980 Egyptian Fertility Survey (1980 EFS), which was conducted by the Central Agency for Public Mobilization and Statistics (CAPMAS) in collaboration with The World Bank, as a part of World Fertility Survey (WFS).

The sample design of this survey (EFS) was required to be representative of the whole of the republic, with the exclusion only of the population of Frontier Governorates, nomads and non-Egyptian nationals. It was to comprise a self-weighting sample of 10000 households and the ultimate target population was ever-married women under the age of 50.

The sample was designed to yield around 10000 completed household schedules. The application in the field of the sampling procedures yielded a sample of 10596 dwellings. Of these, 603 dwellings were vacant and in a further 63 cases the addresses given to the fieldworkers were not of a dwelling. In the remaining 9930 dwellings, 10378 households were identified (ie, an average of 1.045 household per dwelling).

This gave a sample of 10343 households, which were successfully completed in 10079 households or 97.5 percent of the possible maximum.

Within the 10079 households successfully interviewed, a total of 8974 ever-married women under 50 years of age were identified as eligible for the individual interview (i.e. an average number of eligible women per household is equal to 0.89). The number of questionnaires successfully completed in the individual survey for ever-married women was 8788 or 97.9 percent of possible maximum.

2- 2000 Egypt Demographic and Health Survey (2000 EDHS), sample of which was designed to provide estimates of key population and health indicators including fertility and child mortality rates for the country as a whole and for six major administrative regions (the Urban Governorates, Urban Lower Egypt, Rural Lower Egypt, Urban Upper Egypt, Rural Upper Egypt, and the Frontier Governorates). In the Urban Governorates, Lower Egypt, Upper Egypt, the design allowed for governorate-level estimates of most of the key variables, with the exception of the fertility and mortality rates. In the Frontier Governorates, the sample size was not sufficiently large to provide separate estimates for the individual governorates. To meet the survey objectives, the number of households selected in the 2000 EDHS sample from each governorate was not proportional to the size of the population in the governorate. As a result, the 2000 EDHS sample is not self-weighting at the national level, and weights have to be applied to the data to obtain the national-level estimates.

The main fieldwork and callback phases of the survey, out of 17,521 households selected for the 2000 EDHS, 17,103 households were found, and 16,957 households were successfully interviewed which represents a response rate 0f 99 percent.

A total of 15,649 women were identified as eligible to be interviewed. Questionnaires were completed for 15,573 of those women, which represents a response rate of 99.5 percent. The household response rate exceeded 98 percent in all residential categories, and the response rate for eligible women exceeded 99 percent in all areas.

1.3 Review of Literature:

The literature about the relation between the proximate determinants and fertility, and the socioeconomic determinants of each of the proximate variables and fertility is too much to be reviewed in this context. However, only relatively selected topics in the literature will be reviewed.

Kinunbi (1993) says that education and employment status operate through the proximate determinants of marriage, age at first marriage, contraceptive use and postpartum infecundability to influence the high rate of fertility.

Dano (1990), used data of the 1981/82 Nigerian Fertility Survey to identify the key proximate determinants of fertility in Nigeria. The most important determinants were found to be the proportion of married females, followed by practice and duration of breastfeeding and postpartum sexual abstinence.

A UN. Study (1987) focusing on 38 developing countries, examined the socio-economic factors affecting fertility in these countries. The study showed that education is strongly related to fertility in most countries, but the form and size of the relationship vary considerably. On average over all countries, women with seven or more years of education will bear 3.9 children, while women with no schooling will bear nearly 80% more (ie. 6.9 children on average). Also, the study found that women with seven or more years of schooling, who marry on average nearly four years later, have about 25 percentage points higher in contraceptive use and breastfeed children eight months less than women with no education.

Concerning the relationship between women's work and fertility, data on women's employment are used. In Africa and Asia, rural women were more likely to work, whereas the opposite was found in Latin America and, the Caribbean. In countries of Asia, Latin America and the Caribbean, women in modern occupations bore somewhat fewer children on average than women with no recorded economic activity. The existence and strength of the relationship between occupation and fertility are clearly linked to the level of socio-economic development. A strong negative relationship was observed between employment in modern occupation and fertility in more developed countries. Women working in agriculture generally showed smaller fertility level than women with no recorded economic activity.

Abbas and Sabiti (1985) using data from Sudan Fertility Survey of 1978/79, examined the contribution of the main intermediate (proximate) fertility variables to fertility level in Sudan. They found that lactational amenorrhoea played the most important role in suppressing potential fertility, followed by delayed marriage. For most of the population, lactational amenorrhoea can only be relied on as far as spacing or postponing live births is concerned and not to stop birth.

(Bongaarts, 1980; Bongaarts and Potter, 1983): The process of the economic development and fertility is influenced by the change in society. Among the most important factors, which act as intermediate variables in the process of the reproduction are nuptiality pattern, breastfeeding practices, use of contraception and sterility.

Norman (1978) concluded that the factors commonly associated with fertility decline are education, urbanization, improved status and wider employment opportunities for women, mortality declines, and increased practice of family planning. These factors contribute to fertility differentials within countries even in those instances in which the prevailing culture appears to give a disposition to high fertility.

Some studies found that work experience which has little or no effect on fertility does not necessarily contradict previous findings elsewhere (Choudhury, 1978). In addition to women's education and employment, certain background variables should be included in analysis in order to explain not only the linkage between variables but also the mechanisms through which they influence fertility. These variables for instance are current age, duration of marriage, place of residence, ...etc.

Germain (1975) indicated that the relation between women's employment and fertility is even more complex than the relationship between education and fertility, both within and across nations. Several scholars have conflicting opinions about the existence of a relationship, its causes, its directions, and justification of efforts to expand women's non-domestic roles as a means to encourage reducing fertility.

1.4 Previous Studies in Egypt:

The following are some Egyptian studies that focus on analyzing the direct and indirect variables affecting fertility level:

El Deeb (1980), conducted a study based on data collected in 1977 through a sample survey in a selected village called Beshla, Daqahliya governorate in rural Egypt. The study attempted to examine the changes in patterns, levels and trends of fertility, and analyze fertility differentials according to socio-economic and demographic factors. Regarding current fertility, TFR was estimated at about 6 children per woman. As for cumulative fertility, it was found that the average number of children ever born per ever-married woman in the age group 45-49 was 6.8 children per woman. The study revealed a pronounced negative effect of age at first marriage on the number of children ever born beginning at age 25 years. In addition, the analysis concluded that fertility varied inversely with the level of female education. Also females who participated in economic activity had lower fertility level.

Abd-Allah (1981), investigated the recent levels and trends of fertility depending mainly on censuses and vital registration during the period (1960-1976). The study showed that the total fertility rate ranged between its highest levels recorded in 1961 as 6.36 children per woman and its lowest value recorded in 1972 as 5.14 children per woman. Also the cumulative fertility per woman married at age younger than 16 years was 5.11 and 4.6 children for urban and rural women respectively by the end of their reproductive period. The inverse relationship between age at first marriage and fertility seems stronger in the case of urban women than in the case of rural women.

Abou-Gamrah (1982), investigated fertility differentials by mother's education in some countries of the ECWA regions (Economic Commission for Western Asia). The data used in this study was the 1976 census data, and referred to the whole of Egypt. The study shows that education has inverse effect on fertility regardless of the official policy toward fertility behavior. It has been observed that fertility declines as educational attainment rises in Egypt, which is over-populated and has low income, and similarly in Kuwait, which is under-populated and has higher income.

El-Deeb and Casterline (1983) examined the determinants of contraception in Egypt. They found that current use varied by age in both

urban and rural areas. Also, educated women were more likely to use family planning services than illiterate women.

Casterline and Ismail Eid (1983) investigated the impact of village characteristics and reproductive behavior on contraceptive use in Egypt. They found that the socio-economic factors were not sufficient with current use level. There were obstacles to contraceptive adoption. These obstacles consisted mainly of values, norms and social pressures, which acted explicitly or implicitly against family planning.

Abdel-Kader, F. (1987), using data from the 1980 Egyptian Fertility Survey, applied the Bongaarts' model of proximate determinants of fertility for Egypt as a whole. A total fertility rate (TFR) of 5.06 births per woman is estimated from the model, compared with a TFR of 5.09 births per woman actually observed from the survey. The estimated TFR results from the assumed total fecundity (TF) of 15.3 births per woman being inhibited by the indices of non marriage (0.645); contraception (0.694); and lactational infecundability (0.739). The study suggests stopping the reduction in the mean duration of lactational infecundability especially among youngest and urban women, and increasing the level of contraceptive use.

El Ghamry (1988), investigated cumulative fertility levels and trends in Egypt using census data. The results indicated that the completed fertility was 4.67 children for ever married women. About 5.8% of ever married women aged 45-49 years are childless, about 43.2% have from one to four children and 51% have more than four children. Fertility declines rapidly as level of education increases. Fertility in urban and rural areas is increasing by marriage duration.

Osheba (1988) studied the direct (proximate) determinants of the difference in fertility between Rural and Urban Egypt. The fertility difference is attributable to differences in fertility effects of the proximate variables, especially the mean levels of duration of marriage and the fertility effects of contraception.

Osheba (1988) concluded that the mean levels of age at first marriage in Upper Egypt are lower than the corresponding levels in Lower Egypt. This difference is associated with lower educational attainment and premarital work experience in Upper than in Lower Egypt. In rural Egypt, the level of female education has a significant positive effect on the women's age at marriage.

Abdel-fttah, M. (1988), using data from 1980 Egyptian fertility survey, examined the overall reduction from total fecundability rate (TF) to observed total fertility rate (TFR) due to each proximate determinant. In Egypt as a whole, the absolute reduction from TF to TFR was about 9.8 births. The contribution of marriage to this reduction was the highest (38%), followed by lactation infecundability (37%), and contraception (25%). In rural areas of Egypt the absolute reduction from TF to TFR was about 8.2 births. The contribution of lactation infecundability was higher than marriage and contraception. The percentages were about 51%, 34%, and 15% respectively.

Sayed (1989), analyzed cumulative fertility levels in Egypt, using the findings of the Egypt contraceptive prevalence survey (ECPs) carried out in 1984. He found that the mean number of children ever born among ever-married women is 4.2 children per woman. Completed parity by ever-married women aged 45-49 years is high (6.7 children per woman). He estimated GFR, TFR and ASFR for overall Egypt. The estimated GFR reached 143 births per woman. Finally, he examined the pattern of fertility for overall Egypt and various areas and place of residence. It was shown that between 20%-33% of all fertility would be completed by exact age 25. The percentage of completed fertility reached 78.6% and 77.7% for urban and rural areas respectively by exact age 35.

Fouad (1990), compared the findings of the 1980 and 1975 fertility survey. The analysis included a comparison between the mean parities of ever-married women by the level of education in the urban and rural areas. In both urban and rural areas fertility levels for the educated women are reported to be higher in 1975 than in 1980 at all ages, except for women aged 40-44 years in rural areas where the fertility level in 1980 was higher. The opposite is true for the uneducated women.

Osheba (1993), examined fertility in Egypt. He found that the total fertility rate (TFR) declined markedly from 5.3 live births in (1979-1980) to 3.9 in (1990-1992). The rate of contraceptives prevalence almost doubled from 24 percent in 1980 to 47 percent in 1992. The proportions married in the youngest age group 15-19 years also declined by about 38 percent.

El-Nashar (1995), analyzed the levels, trends and determinants of fertility in Egypt. She found that the P/F ratio in total Egypt was more than one for all age groups. This means that the current and recent fertility trends are decreasing over time. This decrease in fertility is mainly due to existing family planning practice.

El-Sayed (1996), analyzed the Regional Differentials in the proximate Determinants of fertility in Egypt. The analysis included comparison between 1980 and 1993, using the findings of the Egyptian Fertility survey and (1980 EFS), and Egypt use Effectiveness of contraceptive survey (1993 EUECS). The highest reduction in fertility level was observed among women in UG and RL, where it declined by about one-half of its level in 1980 (3.8 and 6 live births respectively).

It is clear that most of the previous studies concentrated on analyzing fertility at the national or sectorial level in one point in time depending on data of a specific survey. They aimed to determine the impact of each proximate variable in the observed fertility level. Such studies give us only a picture of the situation of fertility and its proximate determinants at one point of time.

This study, helps to determine the points of weakness and strength in the direct and indirect factors which influenced fertility levels in each region of Egypt separately, during the study, and the factors which can be given more attention in the future to achieve the highest reduction in fertility level, hopping to reach the replacement level in all regions of Egypt in a possible short time.

1.5 Conceptual Framework:

The proximate determinants framework, developed by Bongaarts and Potter, (1983) is used. The model suggests that three classes of determinants affect fertility:

Residence of women in an extended family leads to higher fertility. The economic cost of children and the inconvenience and effort of child care was borne by the extended family. Both spouses were motivated to have children as soon as possible and in considerable numbers to improve or solidify status in the family. With the extended family assisting in the arrangement of marriages, age at first marriage was low (Morgan and Rindfuss, 1984). The hypothetical mechanism of education on fertility comes from the following: It increases the aspiration for upward mobility and the accumulation of wealth, which tends to reduce the desirability of large families (Holsinger and Kasarda, 1976). It reduces the perceived economic utility of children. It influences tastes by exposing people to alternative life styles and improving information on the set of choices available (Dennis, 1976).

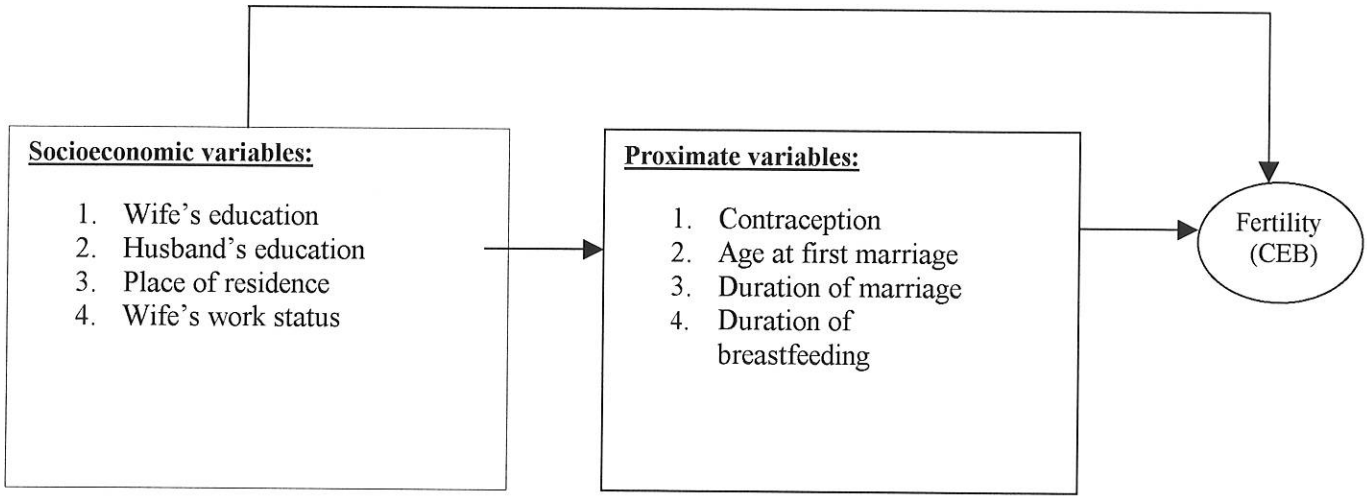
1.5.1 Proximate variables:

These are the biological and behavioral factors through which the socioeconomic and environmental background variables must operate to affect fertility, i.e the proximate variables have direct influence on fertility. The selected proximate variables are: marriage, contraception, induced abortion and postpartum infecundability, which cause the large variations in the total fertility rate (Bongaarts, 1983). The Egypt Demographic and Health Survey, 2000 (EDHS, 2000) which we are going to use contains three variables of this class: age at first marriage, number of marriages, breastfeeding and family planning.

1.5.2 Socioeconomic and environmental variables:

These socioeconomic variables affect fertility indirectly by modifying the proximate determinants. Socioeconomic factors, health and nutrition are determinants of the proximate variables. Health and nutrition are, in general relatively unimportant determinants of fertility (Bongaarts and Potter, 1983; Bongaarts, 1980). Therefore socioeconomic factors are the principal determinants of fertility trends and differentials. The Egypt Demographic and Health Survey, 2000 (EDHS, 2000) data include the following socioeconomic variables: education, place of residence and work status. The conceptual model is shown in figure (1). Figure (1) indicates that the socioeconomic variables affect fertility indirectly through the proximate determinants, age at marriage, duration of marriage and contraceptive use, the arrow showing a direct effect of socioeconomic variables on fertility; represents the effect of these variables through other proximate determinants, which are not included in this analysis.

Figure (1)
Conceptual model (Factors Affecting Fertility)



1.6 Methodology:

1.6.1 Aggregate Analysis:

Bongaarts (1978), an aggregate fertility level analysis, and Bongaarts' and Potter's procedure (1983) for decomposing the change in TFR between two points of time to its components, will be applied two times at the regional level of Egypt, firstly in the base year of study (1980) and secondly in the comparable year (2000). In this model he constructed a set of equations for measuring the influence of the four most important intermediate fertility variables:

- Proportion married
- Contraception
- Induced abortion
- Postpartum infecundability

on fertility by four indexes Cm, Cc, Ca and Ci, respectively.

Cm: index of marriage

(Equals 1 if all women of reproductive age are married and zero in the absence of marriage). Cm is estimated as the weighted average of the age-specific proportion of women currently married, with the weights provided by the age-specific marital fertility rates:

$$Cm = \sum M(a)g(a) / \sum g(a)$$

Where:
M (a): - Age-specific proportion currently married among females.
g (a): - Age-specific marital fertility rates.

This equation can also be written as

$$Cm = TFR / TM$$

Cc = Index of contraception:
(Equals 1 in the absence of contraception and 0 if all women use 100% effective contraception).

$$Cc = 1 - 1.08 \times u \times e$$

Where :
U : Proportion currently using contraception among married women of reproductive age.
e : Average use-effectiveness of contraception.
1.08 : Coefficient represents an adjustment for the fact that women (couples) do not use contraceptives if they know that they are sterile, which means that contraception practice is concentrated among the non –sterile couples.

Ca : Index of Induced Abortion
(equals 1 in the absence of induced abortion and 0 if all pregnancies are aborted).

$$Ca = TFR / (TFR + A)$$

Where:
A : Average number of births averted per woman by the end of the reproductive years.

Ci : Index of postpartum infecundability

It is accomplished by comparing average birth-interval lengths in the presence and absence of lactation. A birth interval can be divided into four components:-

1- An infecundable interval immediately following a birth. (about 1.5months).

2- Waiting time to conception, starts at the first ovulation following birth and ends with a conception (average of this interval ranges from a low of about 5 months to high values that only rarely exceed 10 months, with typical values around 7.5 months).

3- Time added by spontaneous intrauterine mortality. In cases where a conception does not end in a live birth (on average the time added by intrauterine mortality equals about 2 months per birth interval).

4- A nine-months gestation period in a live birth.

Without lactation, a typical average birth interval can therefore be estimated to equal (1.5 + 7.5 + 2 + 9 = 20 months), and with lactation it equals the average total duration of the infecundable period plus 18.5 months (7.5 + 2 + 9).

$$Ci = 20 / (18.5 + i)$$

Where :

i : average duration of infecundability caused by breastfeeding or postpartum abstinence.

The following summarizes the model for the relationships between the four intermediate fertility variables and fertility:

$$TFR = cm \times Cc \times Ca \times Ci \times TF \qquad (1)$$

Bongaarts and Potter (1983) involved a set of equations that allow the quantification of the contribution made by each proximate variable to a given change in the TFR.

Let year 1 and year 2 represent, respectively, the first and last year of the time period for which decomposition of a change in TFR is desired. With a change in TFR from TFR_1 in year 1 to TFR_2 in year 2 and with simultaneous changes in the indices from Cm_1 to Cm_2 from CC_1 to Cc_2 ,

from Ca_1 to Ca_2, from Ci_1 to Ci_2, and from TF_1 to TF_2 between year 1 and year 2, the ratio (TFR_2 / TFR_1) can be expressed as :

$$\frac{TFR2}{TFR1} = \frac{Cm2}{Cm1} \times \frac{Cc2}{Cc1} \times \frac{Ca2}{Ca1} \times \frac{Ci2}{Ci1} \times \frac{TF2}{TF1} \qquad (2)$$

Defining further

$Pf = (TFR_2 / TFR_1) - 1$ (3)

Proportion change in TFR between year1 and year 2.

$Pm = (Cm_2 / Cm_1) - 1$ (4)

Proportion change in TFR due to change in Cm between year 1 and year 2.

$Pc = (Cc_2 / Cc_1) - 1$ (5)

Proportion change in TFR due to change in Cc between year 1 and Year 2.

$Pa = (Ca_2 / Ca_1) - 1$ (6)

Proportion change in TFR due to change in Ca between year 1 and Year 2.

$Pi = (Ci_2 / Ci_1) - 1$ (7)

Proportion change in TFR due to change in Ci between year 1 and Year 2.

$Pr = (TF_2 / TF_1) - 1$ (8)

Proportion change in TFR due to changes in remaining proximate Permanent sterility).

Equation (2) can now be rearranged as :-

$$Pf = Pm + Pc + Pa + Pi + Pr + I \qquad (9)$$

Where:

I :- represents an interaction factor.

This equation simply states that a given proportional change in the TFR between year 1 and year 2 equals the sum of the proportional fertility changes due to the different proximate determinants plus an interaction term. The interaction factor is a complex function of Pm, PC, Pa, PI, and Pr, and can be estimated simply by subtracting the sum of the P's on the right hand side from Pf.

1.6.2 Micro level analysis:

The individual level analysis in this study will use the Multiple Regression analysis and Logistic Regression analysis technique to

investigate the relationship between the socioeconomic and determinant variables and fertility. To give more clarification of the ordinary least square and logistic regression analysis, the following is assumed:-

The Models

1- Multiple Regression Model

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5$$

Where:

β_0 : is a constant term

$\beta_1 - \beta_5$: is the regression coefficient associated with each category of the independent variables.

Y: children ever born as the dependent variable

2- Logistic Regression Model

The logistic regression the probability of an event occurring is given by:

$$Yi = b_0 + b_1 x_{1i} + e_i \qquad i = 1,.....p$$

$$E(y) = P = \text{probability}\ (y = 1)$$

$$y = \frac{1}{e^{-z} + 1} = \frac{e^z}{1 + e^z}$$

$$y = \frac{e^{B0 + B1x}}{1 + e^{B0 + B1x}} = \frac{ep}{1 + ep}$$

$$\ln\left(\frac{P}{1-P}\right) = B_0 + B_1 x_1$$

Where:

P : is the probability of impact of socioeconomic variable on current use

β_0 : is a constant term.

B_1, B_2, B_3 : are the regression coefficient associated with each category of the independent variables

Y_I : currently using contraceptive
equal 1 if using
0 otherwise

$$\text{probability of currently using} = \frac{1}{1 + e^{-z}}$$

$$z = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3$$ **(Gresty, Alan) 1991.**

1.7 Organization of the study:

This research is organized into five main chapters. Chapter one includes this introduction, review of literature, previous studies, objective of the study, data source and methodology . Levels, trends and differentials of current fertility and its proximate determinants are included in chapter two. Chapter three measures the direct and indirect effects on fertility and its trends. Chapter four measures the direct effect and its trends on proximate variables. A brief summary and policy implication are provided in chapter five.

CHAPTER (II)

Levels, Trends, And Differentials Of Current Fertility And Its Proximate Determinants

This chapter comprises an analysis of the differentials, which took place during the study period 1980-2000 in current fertility level and its proximate determinants at the regional level of Egypt (urban governorates UG, urban lower Egypt UL, urban upper Egypt UU, rural lower Egypt RL, rural upper Egypt RU) and Egypt as a whole. Also, Bongaarts' and Potter's procedure for decomposing the change in TFR between two points of time to its components is applied for each region separately and for Egypt as a whole. The first application is in the base year of the study 1980, and the second is in the comparable year 2000. These applications aim to assess the differentials in the relative importance of each proximate to the observed level of current fertility at each time point of the study, on the one hand, and to assess the relative contribution of each proximate determinant to the change which occurred in current fertility level during the study period, on the other hand.

In the preceding chapter, four proximate fertility determinants (marriage pattern, contraceptive use, induced abortion and postpartum infecundability) are considered as the most important proximate determinants. Induced abortion will be excluded from our analysis for two reasons. First, it is illegal in Egypt by the force of law and legacy of Islam. Secondly, the possibility of comparison is not available, because there are no data available in EFS about abortion, and also few cases in EDHS. So, we will assume that the value of index Ca is equal to one, and the most important proximate fertility determinants in Egypt will be

marriage pattern, contraceptive prevalence and postpartum infecundability.

2.1. Differentials in Current Fertility Among Regions:

Age-specific fertility rate (ASFR) and total fertility rate (TFR) represent good measures to assess current fertility level for any society at any point of time. These two fertility measures have some advantages over any other fertility measures. They eliminate the effect of the differentials in age structure, thus they have the possibility of comparison between one place at two points of time or in two places.

Table and figure numbered (2.1) represent the regional differentials which took place during the study period 1980-2000) in ASFRs and TFR. They show that fertility level of Egypt as a whole achieved a substantial reduction through the period of study. The percentage of decline in TFR was about 33%. The highest reduction in current fertility level occurred among those who lived in UU and RL. The percentage of decline was about 42%, 45% respectively. The least reduction in current fertility level occurred in UG by about 25% only. All the value of ASFRs achieved an observed reduction during the study period. It was valid for all regions of Egypt. The highest reduction in ASFRs occurred among women in the first and last age groups of the reproductive period.

Table (2.1)

The Regional Differentials in Age-specific Fertility Rates (ASFR's)

And Total Fertility Rates (TFR), EFS (1980) and DHS (2000).

Age Group	Region of residence								
	UG			UL			UU		
	(EFS) 1980	(DHS) 2000	%of change	(EFS) 1980	(DHS) 2000	%of change	(EFS) 1980	(DHS) 2000	%of change
15-19	59.3	31	-47.7	62.6	29	-53.7	114.1	35	-69.3
20-24	178.5	136	-23.8	223.8	175	-21.8	277.9	152	-45.3
25-29	234.1	187	-20.1	271.6	194	-28.6	292.5	205	-29.7
30-34	165.9	141	-15.0	176.5	144	-18.4	267.2	161	-39.7
35-39	94.6	60	-36.6	86.9	53	-39.0	157.0	90	-42.7
40-44	28.1	19	-32.4	20.8	12	-42.3	48.2	31	-35.7
45-49	7.4	5	-32.4	13.3	3	-77.4	16.5	3	-81.8
TFR	3.84	2.89	-24.7	4.29	3.05	-28.9	5.87	3.39	-42.2
Age Group	RL			RU			All Egypt		
	(EFS) 1980	(DHS) 2000	%of change	(EFS) 1980	(DHS) 2000	%of change	(EFS) 1980	(DHS) 2000	%of change
15-19	105.8	57	-46.1	154.3	77	-50.1	99.3	51	-48.6
20-24	295.9	220	-25.7	311.7	250	-19.8	255.5	196	-23.3
25-29	317.9	199	-37.4	311.8	246	-21.1	285.2	208	-27.1
30-34	246.6	117	-52.6	241.4	185	-23.4	217.4	147	-32.4
35-39	153.6	49	-68.1	152.0	125	-17.8	130.5	75	-42.5
40-44	62.7	17	-72.9	64.9	44	-32.2	48.2	24	-50.2
45-49	16.6	3	-81.9	26.1	6	-77.0	15.5	4	-74.2
TFR	6.00	3.31	-44.8	6.32	4.66	-26.3	5.27	3.53	-33.0

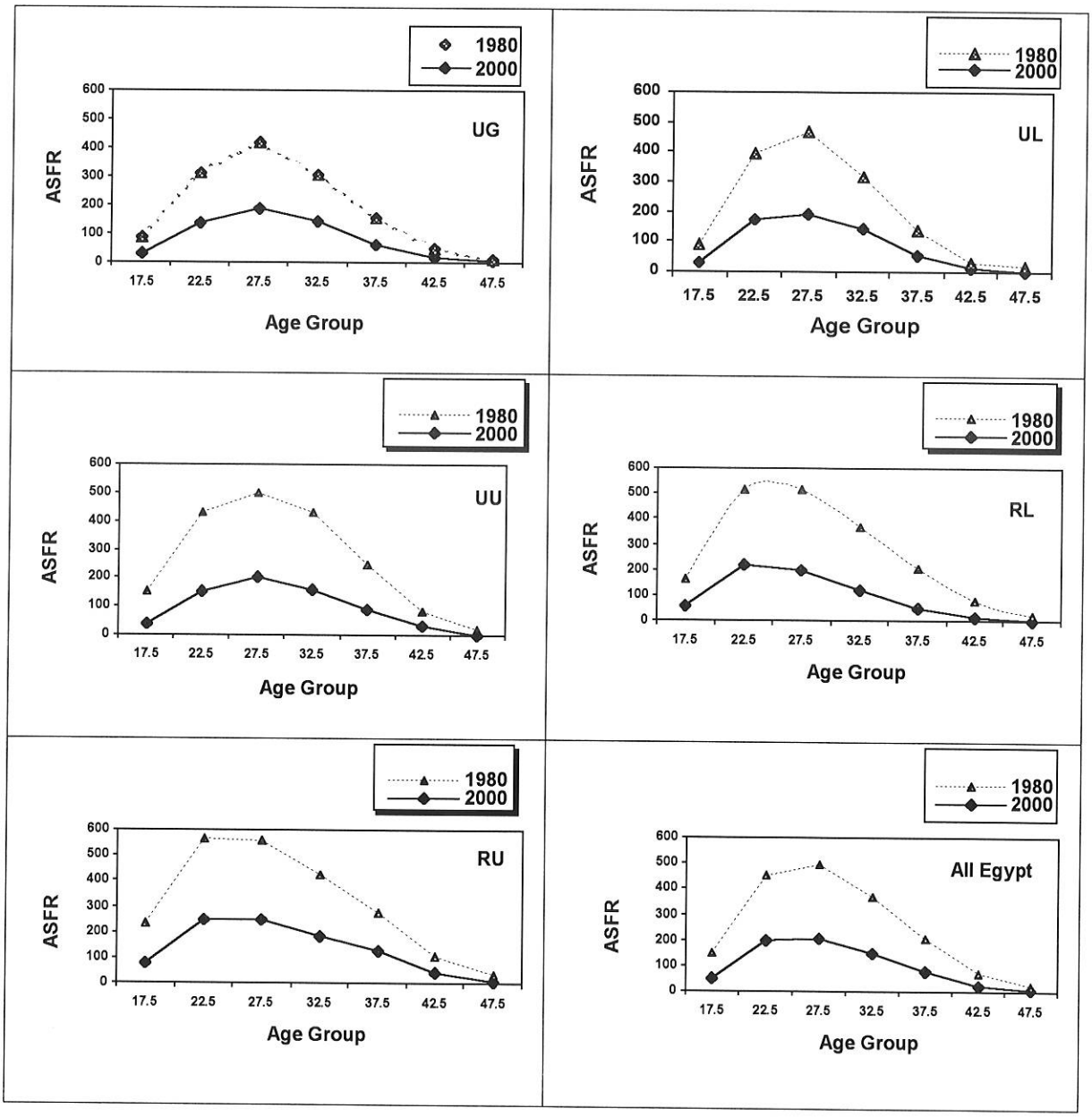
Source:- (1) CAPMAS, 1983 , the Egyptian Fertility Survey , Vol. II, Table 4.17, p.43.

(2) El-Zanaty, F., et. Al. EDHS-2000 reports.

Figure (2.1)

The Regional Differentials in Age-specific Fertility Rates (ASFR's)

EFS (1980) and DHS (2000).



The reduction of the first age group may have occurred as a result of increasing mean age at first marriage, where it increased from about 17.2 years in 1980 to reach about 19.5 years in 2000. The reduction of the last age group may have occurred by the effect of using contraceptives for limitation.

2.2 Differentials in the Proximate Determinants of Fertility Among Regions:

2.2.1 Differentials in Marriage Pattern Among Regions:

Marriage pattern is one of the most important proximate fertility determinants in any society. Fertility is positively related to marriage prevalence, especially in countries, where births almost occur through marriage. Proportion of currently married women at reproductive ages is considered as an indicator of "to what extent marriage is prevalent". The differentials in the proportion of females who were currently married, in 1980 and 2000, at the regional level of Egypt are given in table and Figure (2.2). They show that the highest reduction occurred in RU, where the highest percentage of change was 11. The highest reduction concentrated among women in the first two age groups of reproductive span. The percentage of decline was about 52% for the first age group, and about 15% for the second age group. This phenomenon was valid for all regions of Egypt. This reduction may have occurred as a result of increasing the importance of education among females and their participation in the labor force which led to increasing mean age at first marriage.

Table (2.2)

The Regional Differentials in Age-specific Proportion of Currently Married Women, EFS (1980) and DHS (2000).

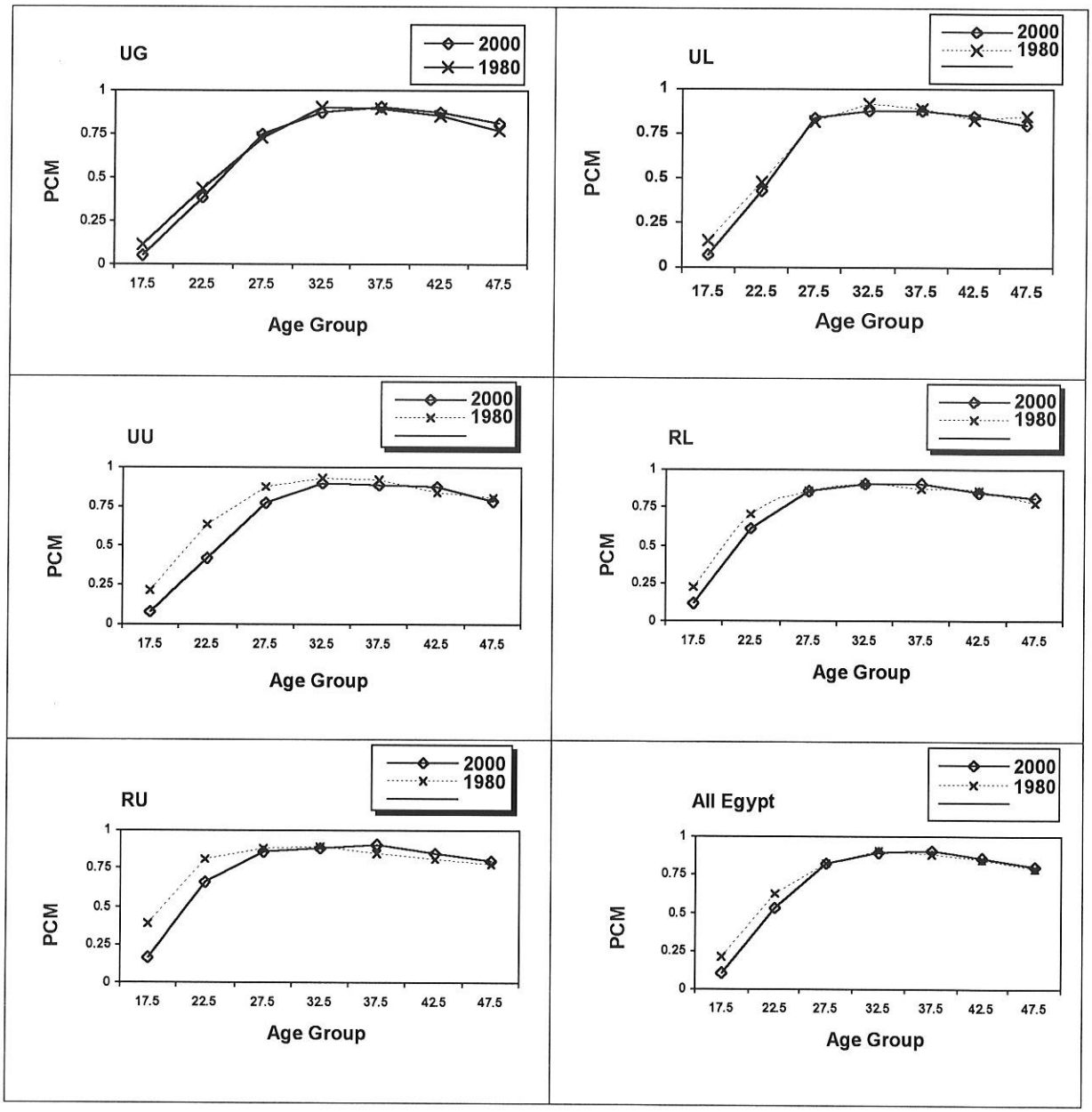
Age Group	Region of residence								
	UG			UL			UU		
	(EFS) 1980	(DHS) 2000	%of change	(EFS) 1980	(DHS) 2000	%of change	(EFS) 1980	(DHS) 2000	%of change
15-19	0.110	0.050	-54.5	0.150	0.071	-52.7	0.212	0.085	-59.9
20-24	0.440	0.390	-11.4	0.484	0.435	-10.1	0.636	0.426	-33.0
25-29	0.728	0.749	2.9	0.821	0.844	2.8	0.874	0.768	-12.1
30-34	0.906	0.878	3.1	0.921	0.879	-4.6	0.932	0.895	-4.1
35-39	0.895	0.911	1.8	0.893	0.883	-1.1	0.925	0.890	-3.8
40-44	0.859	0.872	1.5	0.831	0.854	2.8	0.846	0.870	2.8
45-49	0.776	0.809	4.3	0.853	0.796	-6.7	0.806	0.786	-2.5
15-49	0.585	.601	2.7	0.610	.612	0.3	0.666	.596	-10.5
Age Group	RL			RU			All Egypt		
	(EFS) 1980	(DHS) 2000	%of change	(EFS) 1980	(DHS) 2000	%of change	(EFS) 1980	(DHS) 2000	%of change
15-19	0.222	0.115	-48.2	0.386	0.170	-56.1	0.217	0.105	-51.6
20-24	0.704	0.608	-13.6	0.812	0.656	-19.2	0.623	0.528	-15.2
25-29	0.860	0.853	-0.8	0.884	0.860	-2.7	0.821	0.821	0.00
30-34	0.902	0.905	0.3	0.892	0.886	-0.7	0.905	0.892	-1.4
35-39	0.875	0.911	4.1	0.849	0.902	6.2	0.879	0.902	2.6
40-44	0.864	0.848	-1.9	0.815	0.848	4.0	0.846	0.857	1.3
45-49	0.782	0.811	3.7	0.772	0.801	3.8	0.789	0.805	2.0
15-49	0.668	.646	-3.3	0.738	.654	-11.4	0.654	.628	-4.1

Source:- (1) CAPMAS, 1983, the Egyptian Fertility Survey, Vol. IV, Table A, PP.350-357.

(2) Calculated from clean tape of EDHS, 2000.

Figure (2.2)

The Regional Differentials in Age-specific Proportion of Currently Married Women, EFS (1980) and DHS (2000).



2.2.2 Differentials in Contraceptive Use Among Regions:

The use of contraceptives is considered as one of the most important factors in fertility decrease. The most important factors affecting family planning practice are knowledge of contraception, approval of use and availability of methods. The differentials in the level of contraceptive use among regions or in the trends of contraceptive use over time are related directly to the previous factors.

Table and Figure (2.3) represent the regional differentials in the levels of contraceptive use among currently married women at reproductive ages, in 1980 and 2000. They show that:-

Egypt has achieved a great success in promoting contraceptive use, where the proportion of currently married women currently using contraceptives increased by about 133% (breastfeeding excluded as a method of contraception) throughout the study period. The least increase was in RU, where the lowest percentage of change was (880%). Women aged 30-44 years had the highest level of contraceptive practice at the two points of time of the study. So, they had the least percentage of increase in the level of contraceptive use. This observation may conform with the suggestion that women tend to use contraceptives in later ages of their reproductive life, after they have achieved their desired family size. The highest percentage of increase in the level of contraceptive use is concentrated among women in the first three age groups (15-29). This phenomenon may reflect an improvement in the attention of women to use family

planning for spacing between births. It may also be responsible for the greater part of the reduction which occurred in fertility level, through the study period, since, those women lie at the beginning of reproductive span and they are responsible for the greater part of current fertility level. There is a reduction in the level of contraceptive use among the oldest women in reproductive span (those aged 45 and above) rather than the previous age group. This reduction may have occurred as a result of reaching menopause, or as a result of the women's feeling that they are not exposed to the risk of pregnancy. In general, the regional differentials in the level of contraceptive use narrowed down in 2000 compared with 1980 because regions with initially lower levels in 1980 were able to achieve a much faster increase than the regions with initially higher levels, (El-Sayed Hassan, 1996) .

Table (2.3)

The Regional Differentials in the Contraceptive Prevalence among Currently Married Women at Reproductive Ages, EFS(1980) and EDHS (2000)

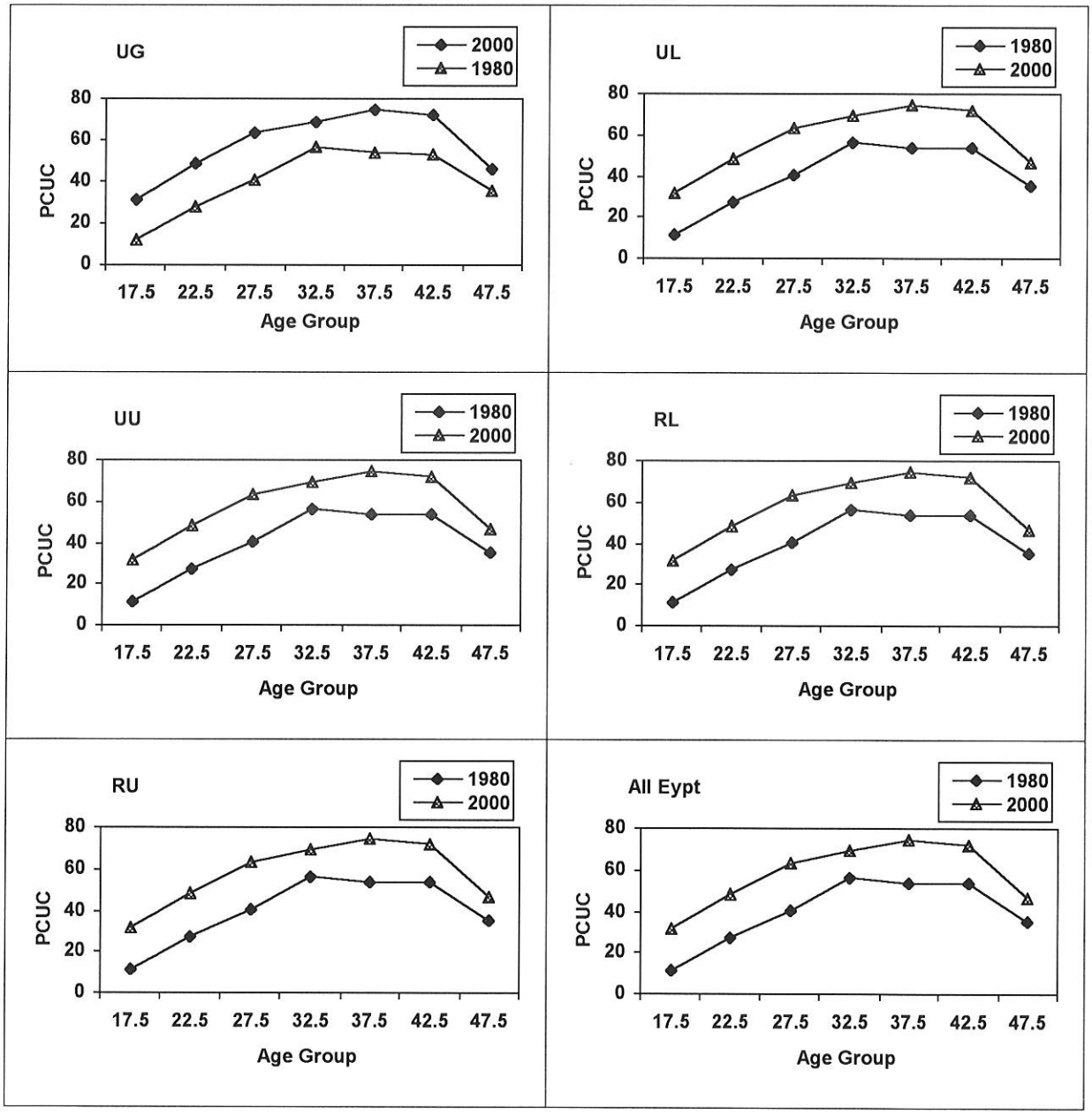
Age Groups	Region of Residence								
	UG			UL			UU		
	(EFS) 1980	(EDHS) 2000	% of Change	(EFS) 1980	(EDHS) 2000	% of Change	(EFS) 1980	(EDHS) 2000	% of Change
15-19	11.8	31.6	167.8	10.5	43.2	311.4	4.2	32.7	678.6
20-24	27.4	48.6	77.4	26.6	46.2	73.7	16.4	41.6	153.7
25-29	40.6	63.3	55.9	39.6	66.0	66.7	24.6	52.8	114.6
30-34	56.1	69.1	23.2	52.3	75.7	44.7	34.5	68.8	99.4
35-39	53.9	74.6	38.4	56.7	72.4	27.7	36.0	65.3	81.4
40-44	53.2	72.2	35.7	58.3	67.6	16.0	31.8	64.1	101.6
45-49	35.4	46.3	30.8	33.3	55.2	65.8	12.1	38.4	217.4
CPR	43.8	62.7	43.2	42.9	64.9	51.3	25.1	55.4	120.7
	RL			RU			All Egypt		
	(EFS) 1980	(EDHS) 2000	% of Change	(EFS) 1980	(EDHS) 2000	% of Change	(EFS) 1980	(EDHS) 2000	% of Change
15-19	3.1	23.0	641.9	0.0	16.7	E	3.8	23.4	515.8
20-24	8.9	47.4	432.6	2.2	30.0	1263.6	12.8	42.7	233.6
25-29	17.3	64.1	270.5	3.7	39.0	954.1	23.9	57.0	138.5
30-34	23.4	75.8	223.9	5.7	50.0	777.2	32.5	67.2	106.8
35-39	29.2	75.3	157.9	6.6	56.3	753.0	33.0	68.0	106.1
40-44	25.5	67.7	165.5	5.3	53.8	915.1	32.3	63.4	96.3
45-49	12.8	46.0	259.4	5.1	34.8	582.4	18.8	42.0	123.4
CPR	18	61.4	241.1	4.1	40.2	880.5	24.1	56.2	133.2

Source:- (1) CAPMAS, 1983, the Egyptian Fertility Survey , Special Tabulations.

(2) El-Zanaty, F., et. Al. EDHS-2000 reports.

Figure (2.3)

The Regional Differentials in the Contraceptive Prevalence among Currently Married Women of Reproductive Ages, EFS (1980) and EDHS (2000)



Regardless of the differentials in the levels of contraceptive use, substantial changes occurred in the type of methods used; these changes are represented in Table and Figure (2.4). They show that:-

The percentage of IUD users increased from about 21% of total users in UG (as the highest percentage of use among regions in 1980) to reach about 71% of total users in the same region (as the highest percentage of use among regions in2000). This increase in the level of IUD use was associated with remarkable decrease in the level of pills use, where it dropped from about 80% of total users in UL (as the highest percentage of use among regions in 1980)to reach about 20.4% in UU (as the highest percentage of use among regions in 2000). The direction toward increasing the percentage of IUD use is desired, since it has the highest effectiveness among all contraceptive methods except for the sterilization method.

Table (2.4)

The Regional Differentials in the Percentage Distribution of Currently Using Contraceptive by Method used, EFS (1980) and DHS (2000)

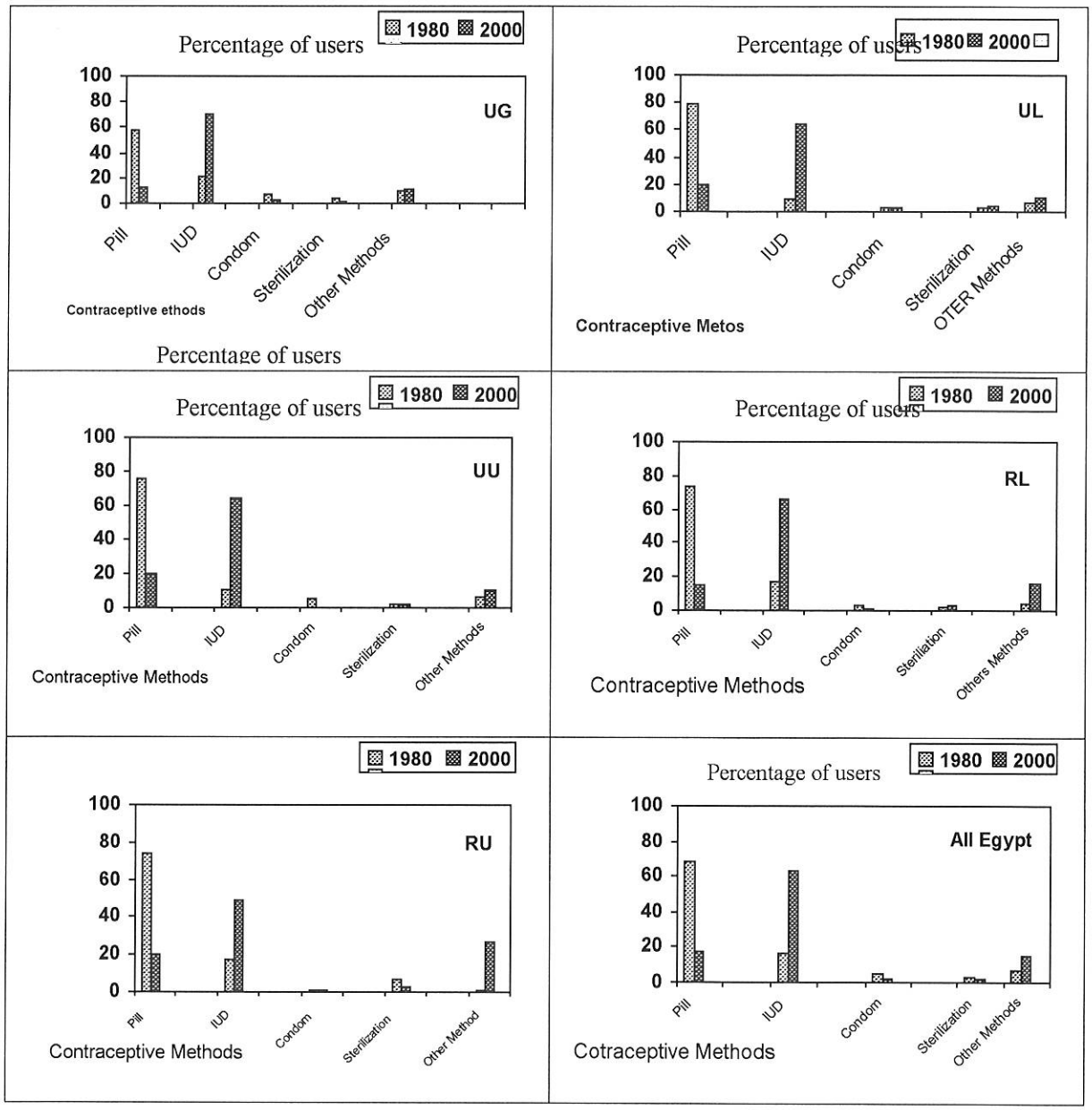
Methods	Region of residence								
	UG			UL			UU		
	(EFS) 1980	(DHS) 2000	%of change	(EFS) 1980	(DHS) 2000	%of change	(EFS) 1980	(DHS) 2000	%of change
Pill	57.7	12.9	-77.6	79.6	19.4	-75.6	76.0	20.4	-73.2
IUD	21.3	70.7	231.9	8.9	64.7	626.9	10.3	64.6	527.2
Condom	6.9	3.0	-56.5	3.2	2.1	-34.4	4.8	2.5	-47.9
Sterilization	4.1	2.1	-48.8	2.2	3.3	50.0	2.1	1.8	-14.3
Others	10.0	11.3	13.0	6.1	10.5	72.1	6.8	10.7	57.4
Total	100	100		100	100		100	100	
Methods	RL			RU			All Egypt		
	(EFS) 1980	(DHS) 2000	%of change	(EFS) 1980	(DHS) 2000	%of change	(EFS) 1980	(DHS) 2000	%of change
Pill	73.7	15.1	- 79.5	73.8	20.1	-72.8	68.3	16.9	-75.3
IUD	16.8	65.8	291.7	17.5	49.0	180.0	16.6	63.3	281.3
Condom	2.8	0.7	-75.0	1.2	1.0	-16.7	4.7	1.8	-61.7
Sterilization	2.5	2.8	12.0	6.3	2.5	-60.3	3.3	2.5	-24.2
Others	4.2	15.5	269.0	1.2	27.4	218.3	7.1	15.5	118.3
Total	100	100		100	100		100	100	

Source:- (1) CAPMAS, 1983, the Egyptian Fertility Survey , Special Tabulations.

(2) Calculated from El-Zanaty, F., et. Al. EDHS-2000 reports.

Figure (2.4)

The Regional Differentials in the Percentage Distribution of Currently Using Contraceptive by Method used, EFS (1980) and DHS (2000)



2.2.3 Differentials in Duration of Lactation Among Regions :

Breastfeeding has a substantial effect on fertility level, especially in developing countries, where it is mostly universal. In Egypt, breastfeeding is nearly universal, since more than ninety percent of mothers breastfeed their children (CAPMAS, EFS, vol.II, 1983 and CDC, EUECS, 1993). The following analysis are carried under the assumption that mean duration of breastfeeding in the last close birth interval is a measure of recent lactation behavior.

Table and Figure (2.5) represent the regional differentials in mean duration of breastfeeding at the two time points of study. They show that:-

Mean duration of breastfeeding was negatively related to the level of development of regions. It was higher in rural areas than urban areas of Egypt. This observation was valid at the two time points of the study. The percentage of reduction in the mean duration of breastfeeding was about 15% for Egypt as a whole. The highest reduction observed among women in the mean duration of breastfeeding was about (23.3%). The least reduction was observed in UL, where the lowest percentage of reduction was (1.9%).

In urban areas, the lowest percentage of change in the mean duration of breastfeeding was associated with the youngest women in the reproductive span. The percentage of change increases as the age of mother increases. This observation may represent a new and desired

lactation behavior. It may have occurred as a result of increasing knowledge and information of mother about the importance of breastfeeding for the health of children, and its importance as a supplementary method of contraception, especially in the first few months after birth.

Mean duration of breastfeeding increases as the age of mother increases (oldest women in reproductive span tend to breastfeed their children for a longer period than youngest women). This observation was valid for all regions.

Table (2.5)

Regional Differentials in the Mean Duration of Breastfeeding

EFS (1980) and DHS (2000)

Age Groups	Regions Of Residence								
	UG			UL			UU		
	(EFS) 1980	(EDH) 2000	% of Change	(EFS) 1980	(EDHS) 2000	% of Change	(EFS) 1980	(EDHS) 2000	% of Change
15-24	13.1	13.6	3.82	13.5	14.7	8.89	16.0	14.8	-7.50
	(10.8)	(6.6)		(8.3)	(7.1)		(9.8)	(6.9)	
25-34	13.6	13.7	0.74	15.1	15.2	0.66	18.4	15.0	-18.48
	(8.9)	(6.6)		(9.6)	(6.7)		(9.7)	(6.5)	
35+	16.2	14.0	-13.58	16.9	18.1	7.10	20.7	16.7	-19.32
	(10.9)	(6.6		(9.6)	(6.6)		(12.4	(7.7)	
Mean Duration of Breastfeeding	14.8	13.7	-7.43	15.7	15.4	-1.91	19.0	15.3	-19.47
	(10.2)	(6.6		(9.5)	(6.8)		(11.1)	(6.8)	
Age Groups	RL			RU			All Egypt		
	(EFS) 1980	(EDH) 2000	% of Change	(EFS) 1980	(EDHS) 2000	% of Change	(EFS) 1980	(EDHS) 2000	% of Change
15-24	16.0	14.7	-8.13	20.2	15.7	-22.28	16.7	15.0	-10.18
	(7.9)	(6.7)		(11.7)	(7.3)		(10.2)	(7.0)	
25-34	18.4	15.8	-14.13	21.2	17.0	-19.81	17.5	15.7	-10.29
	(9.6)	(6.4)		(11.8)	(6.8)		(10.3)	(6.7)	
35+	20.3	15.2	-25.12	23.3	17.6	-24.46	19.7	16.6	-15.74
	(10.3)	(7.1)		(12.6)	(7.9)		(11.4)	(7.6)	
Mean Duration of Breastfeeding	18.8	15.4	-18.09	21.9	16.8	-23.29	18.3	15.6	-14.75
	(9.8)	(6.6)		(12.2)	(7.2)		(10.9)	(6.9)	

Source:- (1) CAPMAS, 1983, the Egyptian Fertility Survey , Special Tabulations.

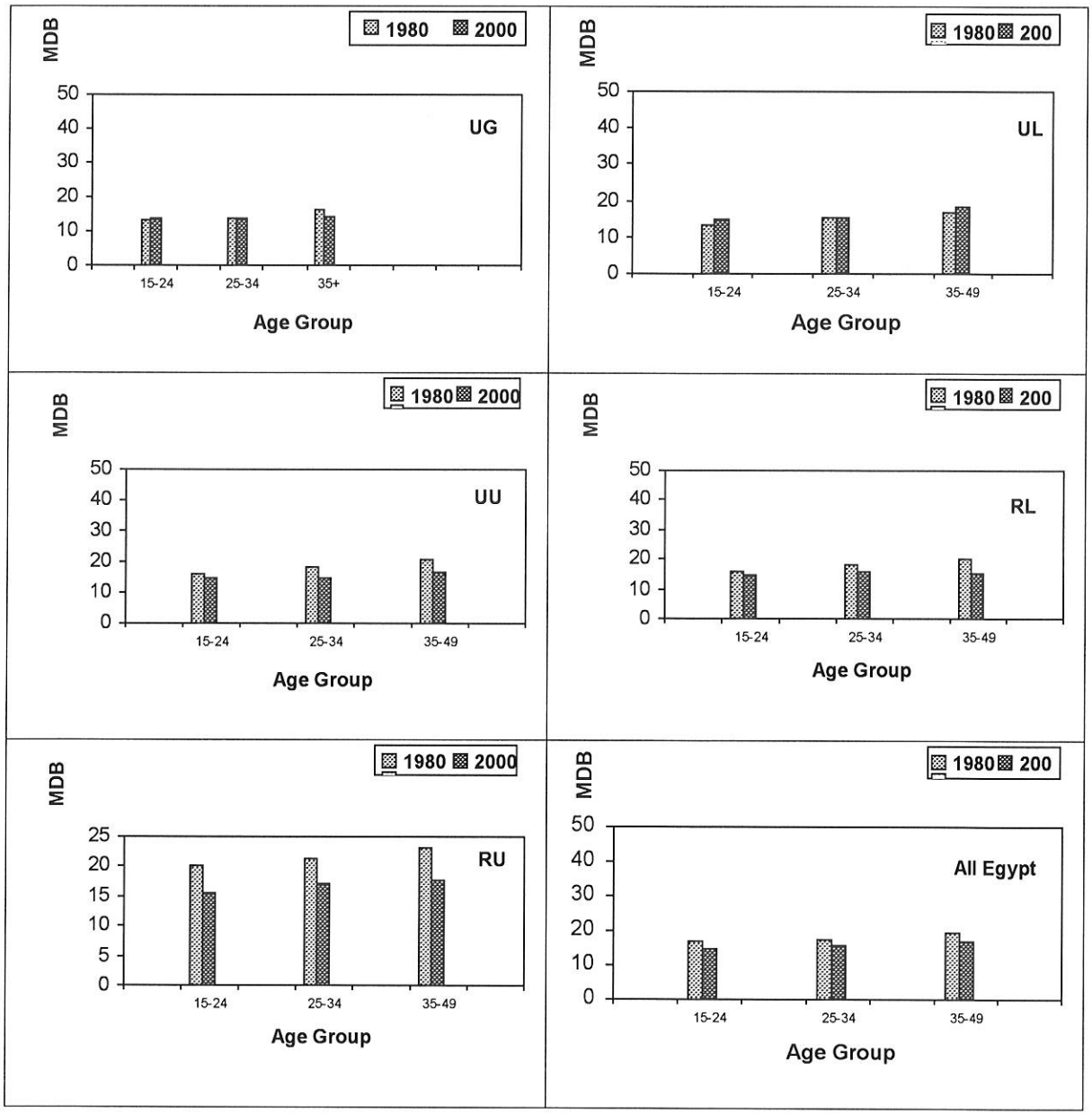
(2) Calculated from clean tape of EDHS, 2000.

(-) Standard Deviation in Parentheses

Figure (2.5)

Regional Differentials in the Mean Duration of Breastfeeding

EFS (1980) and DHS (2000)



2.3 Bongaarts' Indices of the Proximate Determinants of Fertility.

Table (2.6) represents the results of applying Bongaarts' model and an estimation of the basic measures of current fertility, at the regional level of Egypt in 1980 and 2000. This table shows that:-

Regarding the index of marriage Cm: All the values of this index achieved more reduction in the comparable year of study 2000 than in the base year of study 1980. This reduction reflects the negative effect of the changes, which occurred in the proportion of currently married women, on current fertility level caused mainly by increasing AAFM. The highest reduction in the index value was in UU.

This reduction agrees with the previous analysis in (Table 2.2), where the highest reduction in the marriage prevalence was also observed among women of the same region. The least reduction in the value of index Cm was observed in RU.

Regarding the index of contraception Cc: All the values of this index achieved an observed reduction during the study period. This reduction reflects the negative effect of the changes, which occurred in the proportion of current use of any contraceptive method, and the type of method used, on fertility level. The highest reduction in the index value was in RL, where the highest increases in contraceptive prevalence rate during the study period occurred (Table 2.3).

Regarding the index of postpartum infecundability Ci : All the values of this index achieved an observed increase during the reference period. This increase reflects the positive effect of the reduction, which occurred in the mean duration of breastfeeding, on current fertility level. The highest increase in the index value was in UU, while the least increase in the value of Ci was in UL, where the least reduction in mean duration of postpartum infecundability was observed.

In our opinion, TF is higher than its assumed level in urban areas, than in rural areas of Egypt. The reasons of this variation may return to the process of development and its associations of higher educational level and higher mean age at first marriage.

"Increasing in education and age at first marriage leads to higher fecundability. Increases in fecundability in the population lead to higher fertility. So, not all the processes of modernization lead to lower fertility. Modernization leads to a higher rate of coital frequency and consequently to a higher fertility level" (Abd El-Kader, F. 1987).

The same observation was found when Bongaarts' Model was applied to data of the higher developed region in China (Bejing, the capital of the country). The percentage of explanation of the four principal proximate determinants was about 60.5% (Wang et all, 1987). This low percentage of explanation may be attributed also to the previous mentioned reason.

Table (2.6)

Bongaarts Indexes and Estimation of the Basic Fertility Measures, by Region of Residence, EFS (1980) and DHS (2000)

Indices & Measures		Region of Residence					
		UG		UL		UU	
		(EFS) 1980	(EDHS) (2000)	(EFS) 1980	(EDHS) (2000)	(EFS) 1980	(EDHS) (2000)
-Index of Marriage	Cm	0.564	0.393	0.584	0.476	0.719	0.500
-Index of contraceptive use.	Cc	0.582	0.384	0.589	0.361	0.759	0.457
-Index of Postpartum Infecundability	Ci	0.797	0.909	0.800	0.952	0.749	0.913
-Actual Total Fertility Rate	TFR	3.84	2.89	4.29	3.05	5.87	3.39
-Estimated Total fertility Rate	^ TFR	4.00	2.09	4.21	2.50	6.25	3.19
-Total Marital Fertility Rate	TMFR	6.81	7.37	7.35	6.41	8.16	6.78
-Total Natural Marital Fertility Rate	TNMFR	11.70	13.91	12.47	14.57	10.76	13.97
Indices & Measures		RL		RU		All Egypt	
		(EFS) 1980	(EDHS) (2000)	(EFS) 1980	(EDHS) (2000)	(EFS) 1980	(EDHS) (2000)
-Index of Marriage	Cm	0.728	0.508	0.796	0.611	0.689	0.504
-Index of contraceptive.	Cc	0.825	0.401	0.959	0.622	0.769	0.455
-Index of Postpartum Infecundability	Ci	0.714	0.909	0.704	0.840	0.743	0.897
-Actual Total Fertility Rate	TFR	6.00	3.31	6.32	4.66	5.27	3.53
-Estimated Total fertility Rate	^ TFR	6.56	2.83	8.22	4.88	6.02	3.15
-Total Marital Fertility Rate	TMFR	8.24	6.51	7.94	7.64	7.65	6.97
-Total Natural Marital Fertility Rate	TNMFR	9.99	13.91	8.28	12.85	9.95	13.72

Source:- Calculated by the Researcher, Based on Data of Tables (2.1) to (2.5).

(1):- Calculated under the Assumption, TF = 15.3 Births per woman.

2.4 The Relative Importance of the Proximate Determinants of Fertility.

Table (2.7) represents an estimation of the differentials in the relative importance of each proximate fertility determinant, at the regional level in 1980 and 2000. This table shows that:-

At the national level, contraceptive prevalence had the highest fertility-inhibiting effect in 2000, instead of marriage pattern in 1980. It achieved about 50% of the total fertility-inhibiting effect. This phenomenon was valid in UG, UL, RL. The percentages of prevention were about 48%, 56% and 54% respectively in 2000. Marriage pattern had the highest fertility-inhibiting effect in UU at the two time points of study. The percentage of prevention increased from about 37% in 1980 to reach about 44% in 2000. This increase in the fertility-inhibiting effect of marriage was associated with a decline in the fertility-inhibiting effect of lactational infecundability. Breastfeeding practice had the highest fertility-inhibiting effect in RU at the two time points of study. The percentage of prevention declined from about 56.5% in 1980 to about 15% in 2000. This reduction was transformed to an increase in the fertility-inhibiting effect of contraceptive prevalence.

Table (2.7)
Estimation of the Fertility – Inhibiting Effects * of Each Proximate Fertility Determinants, By Region of Residence, EFS (1980) and EDHS (2000)

Proximate Fertility Determinants	Region of Residence											
	UG				UL				UU			
	(EFS) 1980		(EDHS) 2000		(EFS) 1980		(EDHS) 2000		(EFS) 1980		(EDHS) 2000	
	Births Per Woman	%	Births Per Woman	%	Births Per Woman	%	Births Per Woman	%	Births Per Woman	%	Births Per Woman	%
Marriage Cm	4.83	42.7	6.21	47.0	4.63	41.7	5.25	41.0	3.33	36.8	5.35	44.2
Contraception Cc	4.55	40.3	6.37	48.2	4.55	41.0	7.21	56.3	2.79	30.8	6.05	50.0
Lactational Infecundability Ci	1.92	17.0	0.63	4.8	1.91	17.3	0.34	2.7	2.93	32.4	0.71	5.8
Total (15.3-^TFR)	11.30	100	13.21	100	11.09	100	12.8	100	9.05	100		100

Source:-Calculated by the Researcher, Based on Data of Table (2.6)

* :- Total Fertility – inhibiting Effect (Assumed TF – Estimated TFR) is Prorated by the Logarithm of Each Index.

For Example:- Fertility – inhibiting Effect of Cm = (15.3 - ^TFR) * Log Cm / (Log Cm + Log Cc + Log Ci)

Table (2.7)
Continued

Proximate Fertility Determinants	Region of Residence											
	UG				UL				UU			
	(EFS) 1980		(EDHS) 2000		(EFS) 1980		(EDHS) 2000		(EFS) 1980		(EDHS) 2000	
	Births Per Woman	%	Births Per Woman	%	Births Per Woman	%	Births Per Woman	%	Births Per Woman	%	Births Per Woman	%
Marriage Cm	3.28	37.5	5.01	40.2	2.61	36.9	4.50	43.2	3.71	40.0	5.27	43.4
Contraception Cc	1.99	22.8	6.76	54.2	0.47	6.6	4.33	41.6	2.61	28.1	6.05	49.8
Lactational Infecundability Ci	3.47	39.7	0.70	5.6	4.00	56.5	1.59	15.2	2.96	31.9	0.83	6.8
Total (15.3-^TFR)	8.74	100	12.47	100	7.08	100	10.42	100	9.28	100	12.15	100

Source:-Calculated by the Researcher, Based on Data of Table (2.6)

* :- Total Fertility – inhibiting Effect (Assumed TF – Estimated TFR) is Prorated by the Logarithm of Each Index.

For Example:- Fertility – inhibiting Effect of Cm = (15.3 - ^TFR) * Log Cm / (Log Cm + Log Cc + Log Ci)

2.5 The Relative Contribution of the Proximate Determinants of Fertility:

In this part we attempt to quantify the contribution of these changes to the change, which occurred in fertility level during the same period, by using Bongaarts and Potter procedure (1983).

Table (2.8) represents the results of decomposing the change in fertility level (measured by TFR), at the regional level of Egypt, during the study period. This table shows that:-

At the national level, contraceptive prevalence had the largest contribution to the decline in TFR. The fertility-inhibiting effect of contraceptive prevalence was approximately equal to the total decline in fertility level (2.15 births per woman) during the study period, given the marriage, breastfeeding and the residual contribution of secondary proximate determinants almost canceling each other. The same phenomenon was valid in all regions of Egypt.

The changes in the marriage pattern had the largest contribution to the decline in TFR in UU and RL. The fertility-inhibiting effect of marriage pattern was (1.79 & 1.81 births per woman) less than the total decline in TFR (2.48 & 2.69 births per woman respectively) during the study period.

Table (2.8)
Decomposition of the Change in Total Fertility Rate (TFR)
During the Study Period 1980-2000 By Region of Residence,

Factor Responsible for Fertility Change	Region of Residence					
	UG			UL		
	Percentage Of Change In TFR	Distribution Of Change In TFR	Absolute Change In TFR	Percentage Of Change In TFR	Distribution Of Change In TFR	Absolute Change In TFR
-Proportion Married.	-30.32	-122.55	-1.16	-18.49	-63.98	-0.79
-Contraceptive Prevalence.	-34.02	-137.51	-1.31	-38.71	-133.94	-1.66
-Duration of Postpartum Infecundability.	14.05	56.79	0.54	19.0	65.74	0.82
-Other Proximate Determinants	43.75	176.84	1.68	19.61	67.85	0.84
-Interaction	18.20	-73.57	-0.70	-10.31	-35.67	-0.44
Total	-24.74	100	-0.95	-28.90	100	-1.24
Factor Responsible for Fertility Change	UU			RL		
	Percentage Of Change In TFR	Distribution Of Change In TFR	Absolute Change In TFR	Percentage Of Change In TFR	Distribution Of Change In TFR	Absolute Change In TFR
-Proportion Married.	-30.46	-72.09	-1.79	-30.22	-67.41	-1.81
-Contraceptive Prevalence.	-39.79	-94.18	-2.34	-51.39	-114.63	-3.08
-Duration of Postpartum Infecundability.	21.90	51.83	1.29	27.31	60.92	1.64
-Other Proximate Determinants	12.77	30.22	0.75	28.57	63.73	1.71
-Interaction	-6.67	-15.79	-0.39	-19.1	-42.61	-1.15
Total	-42.25	100	-2.48	-44.83	100	-2.69
Factor Responsible for Fertility Change	RU			All Egypt		
	Percentage Of Change In TFR	Distribution Of Change In TFR	Absolute Change In TFR	Percentage Of Change In TFR	Distribution Of Change In TFR	Absolute Change In TFR
-Proportion Married.	-23.24	-88.47	-1.47	-26.85	-81.31	-1.41
-Contraceptive Prevalence.	-35.14	-133.76	-2.22	-40.83	-123.65	-2.15
-Duration of Postpartum Infecundability.	19.32	73.54	1.22	20.73	62.78	1.09
-Other Proximate Determinants	23.38	89.00	1.48	27.27	82.58	1.43
-Interaction	-10.59	-40.31	-0.67	-13.34	40.40	-0.70
Total	-26.27	100	-1.66	-33.02	100	-1.74

Source:- Calculated from Data of Table (2.6).

CHAPTER III
Direct and Indirect Effects on Fertility and its Trends

Introduction:

The inverse impact of rapid population growth on social and economic development efforts in Egypt has been sufficiently acknowledged. Thus, the government has given the atmost priority to bringing down the rate of population growth through mainly reducing fertility.

In Bongaarts' framework socioeconomic and cultural factors are termed indirect determinants because they influence fertility only indirectly, through one or more of the proximate determinants. Many policy planners and decision markers are also interested in measuring the fertility impact of socioeconomic and cultural factors such as women's education, occupation, income, and social status.

3.1 Direct Effect on Fertility

3.1.1 Regional Differentials in MCEB According to Age at First marriage:-

It is a common belief that age at marriage is inversely related to fertility. While early marriage of women has been conducive to high fertility (Osborn, 1958), late marriage is argued to have a fertility reducing effect (Coale 1975: 348). In this analysis women are classified into two groups according to their age at first marriage. The first group includes those whose age at first marriage is less than 18 years. The second group includes those whose age at first marriage is 18 years and over. Table (3.1) shows that :-

The first group of women has higher mean number of children ever born (MCEB) than the second group. This observation was valid for all regions of Egypt at the two time points of the study. All the values of MCEB achieved a reduction during the study period, except in RU, where the change in MCEB increased for the first group of women. Where age at first marriage is less than 18 years the highest reduction in the MCEB occurred among women of the second group in RL. The percentage of reduction was about 19%. The least reduction was about 3.6% among women of the second group in UU. Reduction occurred during the study period in the absolute difference between MCEB of the first and second groups. This reduction may reflect the decline, which occurred throughout the study period in the importance of age at first marriage in determining fertility level. This reduction was about 6% for Egypt as a whole, and it ranged between 29% in UG, and 14% in UU, while no change occurred in this difference in RL. But there was an increase in the importance of age at first marriage in RU.

3.1.2 ***Regional Differentials in MCEB According to Breastfeeding:-***

In this analysis we conform to the breastfeeding status of the child before last as a measure of the recent breastfeeding behavior among women in Egypt. In this analysis women are classified into two groups according to their breastfeeding. The first group includes those who breastfed less than 6 months (short period). The second group includes those who breastfed 6 months and over (long period). Table (3.1) shows that:-

At the national level, breastfeeding for 6 months and over had higher number of MCEB than less than 6 months, which is not expected. It is the opposite of the theoretical effect of breastfeeding on fertility. Our construction of this phenomenon is that, most of women who breastfed for a short time are highly educated (secondary level and higher) and working women. They are more likely to use an effective method of contraception after a short time of giving birth to control their fertility than women who breastfeed for longer duration. They also are more likely to get married for the first time at higher ages than other women. The strength of the unexpected effect of breastfeeding on MCEB decreased throughout the study period. This was clear from decreasing the absolute differences between the mean children ever born MCEB of breastfeeding a long period and a short period, i.e. from about one child in 1980 to reach about two children in 2000. This reduction may be considered as an indicator of reducing the relative importance of breastfeeding in determining the cumulative fertility level.

3.1.3 *Regional Differentials in MCEB According to Contraceptive use:-*

Women who ever use contraceptives had higher MCEB than those who never use at the two points of the study. Table (3.1) shows that:-

In general, this observation was valid for Egypt as a whole and for all regions. The clarification available of this phenomenon in all regions is that, women may tend to use contraceptives after they achieve their desired family size. "Women in Rural Upper Egypt, whether using the IUD or the pill, tend to use for a shorter period of time than do women in Lower Egypt" (Khalifa et al., 1982) and "in Rural Upper Egypt extended-use-effectiveness of contraception is very low because one half of ever-users of the pill, i.e. 85-90% of ever-users of all methods, are not aware of the proper use of that method. In addition, users of the pill or the IUD, i.e. virtually all users in Rural Upper Egypt, tend to use for a short period of time" (Osheba, 1990). The highest reduction in the MCEB between 1980 and 2000 was observed among ever users and never users of contraceptives in RL Egypt. The least reduction was in RU Egypt.

Table (3.1)

The Regional Differentials in the Mean Number of Children Ever Born (MCEB) among the target Women According to the Proximate Fertility Variables, EFS (1980) and EDHS (2000)

Proximate Fertility Variables	Regions of Residence								
	UG			UL			UU		
	(EFS) 1980	(EDHS) 2000	% Of Change	(EFS) 1980	(EDHS) 2000	% Of Change	(EFS) 1980	(EDHS) 2000	% Of Change
Age at First Marriage									
Less than 18 Years	4.6	3.9	-16.0	4.6	4.0	-13.0	4.9	4.5	-8.2
18 years and Over	2.5	2.4	-5.9	2.8	2.5	-10.7	2.8	2.7	-3.6
Difference	2.1	1.5	-28.6	1.8	1.5	-16.7	2.1	1.8	-14.3
Breastfeeding									
- <6 months	4.4	3.3	-25.0	4.6	2.9	-36.9	5.3	4.0	-24.5
- 6 months+	5.2	2.9	-44.2	5.1	2.8	-45.1	5.7	3.5	-38.6
Difference	-0.8	0.4	-0.150	-0.5	0.1	-0.120	-0.4	0.5	-0.225
Contraceptive Use									
- Ever Use	4.3	3.2	-25.6	4.5	3.4	-24.4	5.1	3.8	-25.5
- Never Use	2.6	1.4	-46.2	2.6	1.4	-46.2	3.9	2.2	-43.5
Difference	1.7	1.8	5.9	1.9	2.0	5.3	1.2	1.6	33.3
Total	4.7	2.9	-38.3	4.9	3.1	-36.7	5.5	3.4	-38.2

Source:- (1) CAPMAS, 1983, the Egyptian Fertility Survey , Special Tabulations.

(2) Calculated from clean tape of EDHS, 2000.

Table (3.1) Continued

Proximate Fertility Variables	Regions of Residence								
	RL			RU			All Egypt		
	(EFS) 1980	(EDHS) 2000	% Of Change	(EFS) 1980	(EDHS) 2000	% Of Change	(EFS) 1980	(EDHS) 2000	% Of Change
Age at First Marriage									
Less than 18 Years	4.8	4.2	-12.5	4.4	4.8	9.1	4.7	4.3	-8.5
18 years and Over	3.2	2.6	-18.8	3.5	3.1	-11.4	2.9	2.6	-10.3
Difference	1.6	1.6	0.0	0.9	1.7	88.9	1.8	1.7	-5.6
Breastfeeding									
- <6 months	5.1	3.1	-39.2	5.6	4.3	-23.2	4.9	3.6	-26.5
- 6 months+	5.6	3.2	-42.9	5.5	4.4	-20.0	5.5	3.6	-34.5
Difference	-0.5	-0.1	20.0	0.1	-0.1	-1.0	-0.6	0.0	0.0
Contraceptive Use									
- Ever Use	5.7	3.9	-31.6	6.5	5.0	-23.1	4.9	3.9	-20.5
- Never Use	3.7	1.9	-48.6	4.0	3.2	-20.0	3.6	2.3	-36.1
Difference	2.0	2.0	0.0	2.5	1.8	-0.28	1.3	1.6	23.1
Total	4.4	3.5	-20.5	4.3	4.3	0.0	4.1	3.5	-14.6

Source:- (1) CAPMAS, 1983, the Egyptian Fertility Survey , Special Tabulations.

(2) Calculated from clean tape of EDHS, 2000.

3.2 Indirect Effect on Fertility and its Trend:-

3.2.1 Analysis of the Impact of socio-economic Variables on Mean Children Ever Born (MCEB):-

Table (3.2) represents the differentials in the mean children ever born among the target women, according to some selected socio-economic variables in all regions. This table shows that:-

- Woman's education had a negative impact on MCEB. This observation agrees with the hypothetical effect of woman's education on CEB (better educated women had a few number of children than less educated) . In this analysis women's and husbands' education are classified into two groups. The first group includes those with less than primary. The second group includes those with primary and above.

- Examining the impact of education on MCEB showed that :-

The first group of women had greater mean number of children ever born (MCEB) than the second group. This observation was valid for all regions of Egypt at the two time points of the study. All the values of MCEB for the uneducated women as well as the educated achieved a reduction during the study period, except for the uneducated in RU. The highest reduction in the MCEB occurred among educated women in RL. The percentage of reduction was about 42%. The least reduction for educated women was about 24% in UG. Reduction that occurred during the study period in the absolute difference between MCEB of the first and second education groups may reflect the decline (which occurred throughout the study period) in the importance of education. This reduction was about 31% for Egypt as a whole. The impact of education on MCEB was higher in 2000 (2.1 children) than in 1980 (1.2 children). This observation was valid for all regions of Egypt. The highest impact of education on the MCEB occurred among women in Rural Upper Egypt; the difference in MCEB between educated and uneducated women was 2.3 children in 2000. The

least impact of education on MCEB in 2000 occurred among women in UG and UL. The difference in MCEB between educated and uneducated women is 1.6 children.

The wives of the first group of husbands (uneducated) have higher mean children ever born (MCEB) than wives of the second group of husbands (educated). This observation was valid for all regions of Egypt at the two time points of the study. All the values of MCEB achieved a reduction during the study period, except for wives of uneducated husbands in RU. The highest reduction in the MCEB occurred among women of educated husbands in RL. The percentage of reduction was about 39%. The least reduction was about 24% in UL. Reduction that occurred during the study period in the absolute difference between MCEB of the first and second education groups, may reflect the decline, which occurred throughout the study period in the importance of education. This reduction was about 32% for Egypt as a whole. The impact of education on MCEB was higher in 2000 than in 1980. This observation was valid for all regions of Egypt except in UL. The highest impact of education on the MCEB in 2000 occurred among husbands in RU. The difference in MCEB between educated and uneducated husbands was about 2 children. The least impact of education on MCEB occurred among husbands in UL. The difference in MCEB between educated and uneducated husbands was about 1.2 children.

- Woman's work experience before marriage had a negative impact on her CEB. The absolute difference between the two mean of CEB among working and not working women before marriage was about one child at the national level. It reached its highest level in UU in 1980 (about 2 children), and reached its lowest level in RU (about one fifth child) in 1980.

Table (3.2)

MCEB For Ever Married Women by Region of Residence and some Socioeconomic Characteristics

Socioeconomic Variables	Regions of Residence								
	UG			UL			UU		
	(EFS) 1980	(EDHS) 2000	% 0f Change	(EFS) 1980	(EDHS) 2000	% 0f Change	(EFS) 1980	(EDHS) 2000	% 0f Change
Wife's Education									
Less than primary	4.4	3.8	-13.6	4.4	3.9	-11.4	4.8	4.6	-4.2
Primary and above	2.9	2.2	-24.1	3.1	2.3	-25.8	3.3	2.3	-30.3
Difference	1.5	1.6	6.7	1.3	1.6	23.1	1.5	2.3	53.3
Husband's Education									
Less than primary	4.4	3.7	-15.9	4.8	3.8	-20.8	4.6	4.5	-2.2
Primary and above	3.5	2.4	-31.4	3.4	2.6	-23.5	4.1	2.8	-31.7
Difference	0.9	1.3	44.4	1.4	1.2	-14.3	0.5	1.7	240
Wife's Work Status									
Doesn't woke	4.0	3.1	-22.5	4.1	3.1	-24.4	4.6	3.7	-19.6
Works	2.5	2.3	-8.0	2.5	2.7	8.0	2.7	2.4	-11.1
Difference	1.5	0.8	-46.7	1.6	0.4	-75.0	1.9	1.3	-31.6

Source:- (1) CAPMAS, 1983, the Egyptian Fertility Survey , Special Tabulations.

(2) Calculated from clean tape of EDHS, 2000.

Table (3.2) Continued

Socioeconomic Variables	RL (EFS) 1980	RL (EDHS) 2000	RL % 0f Change	RU (EFS) 1980	RU (EDHS) 2000	RU % 0f Change	All Egypt (EFS) 1980	All Egypt (EDHS) 2000	All Egypt % 0f Change
Wife's Education									
Less than primary	4.5	4.1	-8.9	4.3	4.7	9.3	4.4	4.3	-2.3
Primary and above	3.6	2.1	-41.7	3.6	2.4	-33.3	3.2	2.2	-31.3
Difference	0.9	2.0	122.2	0.7	2.3	228.6	1.2	2.1	75.0
Husband's Education									
Less than primary	4.5	4.2	-6.7	4.3	4.9	13.9	4.5	4.3	-4.4
Primary and above	4.1	2.5	-39.0	4.2	2.9	-30.9	3.8	2.6	-31.6
Difference	0.4	1.7	325.0	0.1	2.0	1900	0.7	1.7	142.9
Wife's Work Status									
Doesn't woke	4.6	3.5	-23.9	4.3	4.3	0.0	4.3	3.7	-13.9
Works	3.9	3.4	-12.8	4.1	3.2	-21.9	3.4	2.7	-20.6
Difference	0.7	0.1	-85.7	0.2	1.1	450.0	0.9	1.0	11.1

Source:- (1) CAPMAS, 1983, the Egyptian Fertility Survey , Special Tabulations.

(2) Calculated from clean tape of EDHS, 2000

3.3 The Correlation Matrix Between the Variables.

The main intention of representing the Bi-variate correlation matrix is to determine and assess the degree and the strength of the relationship between the variables in the regression equation.

Tables (3.3) and (3.4) represent the regional differentials in the bi-variate correlation matrix of the variables, at the two points of time of the study 1980 and 2000. These tables show that:-

- The correlation coefficients between CEB (the dependent variable) and all the independent variables were statistically significant at level (0.01). This observation was valid for Egypt as a whole at the two points of time in the study, with some difference among regions.

- Correlation coefficients between CEB and woman's age at first marriage were significant in all regions of Egypt at the two points of time of the study.

- Correlation coefficients between CEB and current age of woman were significant in UG, UL, and RL in the base year of the study, and in all regions in the comparable year of the study.

- Correlation coefficients between CEB and duration of breastfeeding were significant in UG and UL in the base year of the study, and in RU in the comparable year of the study. But the relationship was positive in most cases. But the inverse impact occurred between the ever use contraceptive and number of children ever born.

- Correlation coefficients between CEB and ever use of contraceptives were significant in UU, and in rural areas of Egypt in the base year of the study, and in all regions in the comparable year of the study. But in almost cases the relationship was positive. This positive relationship between ever use of contraceptives and CEB might be due to the reverse causation between the two variables (as contraceptives reduce number of CEB, and the number of

children ever born motivates women to use contraceptives, i.e. the greater the number of children ever born the woman has, the more likely she is to use contraceptives).

- The highest correlation coefficient among the independent variables was about (0.29) between duration of breastfeeding and age at first marriage in UL in 1980. So, we can expect that such correlation between independent variables will not raise the problem of collinearity between any two independent variables in the regression equations.

Table (3.3)
Bi-variate Correlation Matrix of the Variables, According to Region of Residence, (EFS) 1980

Variables		CEB	CAW	AFM	DB	EUC
UG						
Children Ever Born	(CEB)	1.000	0.182*	-0.587*	0.205*	-0.052
Current Age of Woman	(CAW)		1.000	-0.045	-0.057	0.063
Age At First Marriage	(AFM)			1.000	-0.248	0.117
Duration of Breastfeeding	(DB)				1.000	-0.204*
Ever Use of Contraceptive	(EUC)					1.000
UL						
Children Ever Born	(CEB)	1.000	0.275*	-0.477*	0.207*	0.001
Current Age of Woman	(CAW)		1.000	-0.112	0.105	0.065
Age At First Marriage	(AFM)			1.000	-0.288*	0.013
Duration of Breastfeeding	(DB)				1.000	-0.119
Ever Use of Contraceptive	(EUC)					1.000
UU						
Children Ever Born	(CEB)	1.000	0.205	-0.534*	0.082	-0.272*
Current Age of Woman	(CAW)		1.000	0.017	0.044	-0.070
Age At First Marriage	(AFM)			1.000	-0.219*	0.206
Duration of Breastfeeding	(DB)				1.000	-0.184
Ever Use of Contraceptive	(EUC)					1.000
RL						
Children Ever Born	(CEB)	1.000	0.260*	-0.388*	0.047	0.105*
Current Age of Woman	(CAW)		1.000	-0.022	0.041	0.032
Age At First Marriage	(AFM)			1.000	-0.141*	-0.084
Duration of Breastfeeding	(DB)				1.000	-0.058
Ever Use of Contraceptive	(EUC)					1.000
RU						
Children Ever Born	(CEB)	1.000	0.110	-0.378*	-0.052	0.144*
Current Age of Woman	(CAW)		1.000	0.163	-0.056	0.001
Age At First Marriage	(AFM)			1.000	-0.020	0.049
Duration of Breastfeeding	(DB)				1.000	-0.066
Ever Use of Contraceptive	(EUC)					1.000
All Egypt						
Children Ever Born	(CEB)	1.000	0.177*	-0.489*	0.144*	-0.110*
Current Age of Woman	(CAW)		1.000	0.012	-0.015	0.051
Age At First Marriage	(AFM)			1.000	-0.203	0.120
Duration of Breastfeeding	(DB)				1.000	-0.212
Ever Use of Contraceptive	(EUC)					1.000

Source:- CAPMAS, 1980, the Egyptian Fertility Survey, Special Tabulations.
**:- Significant at Level .01
*:- Significant at Level .05

Table (3.4)
Bi-variate Correlation Matrix of the Variables, According to Region of Residence, (EDHS) 2000

Variables		CEB	CAW	AFM	DB	EUC
UG						
Children Ever Born	(CEB)	1.000	0.495**	-0.396**	-0.087	0.364**
Current Age of Woman	(CAW)		1.000	0.107**	-0.067	0.156**
Age At First Marriage	(AFM)			1.000	-0.048	-0.124**
Duration of Breastfeeding	(DB)				1.000	-0.21
Ever Use of Contraceptive	(EUC)					1.000
UL						
Children Ever Born	(CEB)	1.000	0.619**	-0.385**	0.019	0.353**
Current Age of Woman	(CAW)		1.000	0.029	0.114	0.191**
Age At First Marriage	(AFM)			1.000	-0.022	-0.106**
Duration of Breastfeeding	(DB)				1.000	0.002
Ever Use of Contraceptive	(EUC)					1.000
UU						
Children Ever Born	(CEB)	1.000	0.569**	-0.399**	0.106	0.270**
Current Age of Woman	(CAW)		1.000	0.043	0.084	0.124**
Age At First Marriage	(AFM)			1.000	-0.113	-0.014
Duration of Breastfeeding	(DB)				1.000	-0.122*
Ever Use of Contraceptive	(EUC)					1.000
RL						
Children Ever Born	(CEB)	1.000	0.695**	-0.382**	0.043	0.345**
Current Age of Woman	(CAW)		1.000	-0.073**	0.059	0.167**
Age At First Marriage	(AFM)			1.000	-0.096**	-0.092**
Duration of Breastfeeding	(DB)				1.000	0.046
Ever Use of Contraceptive	(EUC)					1.000
RU						
Children Ever Born	(CEB)	1.000	0.697**	-0.326**	0.090**	0.302**
Current Age of Woman	(CAW)		1.000	-0.030	0.125**	0.156**
Age At First Marriage	(AFM)			1.000	-0.079*	-0.072**
Duration of Breastfeeding	(DB)				1.000	-0.086**
Ever Use of Contraceptive	(EUC)					1.000
All Egypt						
Children Ever Born	(CEB)	1.000	0.593**	-0.394**	0.090	0.272
Current Age of Woman	(CAW)		1.000	0.049**	0.073**	0.173**
Age At First Marriage	(AFM)			1.000	-0.118**	-0.025**
Duration of Breastfeeding	(DB)				1.000	-0.075**
Ever Use of Contraceptive	(EUC)					1.000

Source :- Calculated from clean tape of EDHS, 2000
** :- Significant at Level .01
* :- Significant at Level .05

3.4 Model Specification and Measurement of the variables:-

The multiple regression equation will be as follows:

$$CEB = a + b_1 AAFM_i + b_2 DB_i + b_3 WEDU_i + b_4 HEDU_i + b_5 WWEBM_i + e_i$$

Where: -

CEB: - denotes number of children ever born (dependent Variable).

AAFM: - denotes age at first marriage (measured by complete Single years).

CAW: - denotes current age of woman (measured by complete Single Years).

DB: - denotes duration of breastfeeding (measured by Complete single months).

WEDU: - denotes woman's education (a binary variable, that Takes the value 1 if she has any education certificate and the value 0 otherwise).

HEDU: - denotes husband's education (a binary variable, that Takes the value 1 if he has any education certificate and the value 0 otherwise).

WWEBM: - denotes woman's work experience before marriage (a binary variable, that takes the value 1 if she worked before marriage and the value 0 otherwise).

a :- is a coefficient representing the intercept number of children ever born, when all the b, s are set to zero.

b_1 :- is a coefficient representing the annual rate of change of age at first marriage AAFM.

b_2 :- is a coefficient representing the monthly rate of Change of duration of breastfeeding DB.

b_3 :- is a coefficient representing the effect of woman's education WEDU on CEB.

b_4 :- is a coefficient representing the effect of husband's education HEDU on CEB.

b_5 :- is a coefficient representing the effect of woman's work experience before marriage WWEBM on CEB.

e_i :- denotes random error for the ith individual.

3.4.1 Quantitative measures of the Impact of Socioeconomic and Proximate Fertility Determinants on CEB:-

In this part we apply the ordinary least squares multiple regression analysis on the previous equation to investigate the effect of each independent variable on CEB.

Table (3.5) represents the results of applying the multiple regression of the proximate and socioeconomic variables on CEB, among the target women, at the regional level, in 1980 (EFS) and 2000 (EDHS). The coefficients in this table are unstandardized partial regression coefficients measuring the net fertility effects of the socioeconomic and proximate variables. This table shows that:-

- The coefficients of AFM show that woman's age at first marriage was negative and significant in both 1980 and 2000. This observation was valid for all regions of Egypt. The highest coefficient of AFM in 1980 was in RL. It showed that a one-year increase in woman's age at first marriage would decrease, on average, her fertility by about one-fourth of a child, keeping other things constant. The highest coefficient in 2000 also was in RL. It showed a reduction in the fertility level by about one third of a child for one-year increase in AAFM, keeping other things constant. The strength of the negative effect of woman's age at first marriage increased during the study period in all regions of Egypt; this result was not expected. Age at first marriage had and still has its impact on fertility.

- The coefficients of DB showed that duration of breastfeeding was negative and significant. This observation was valid for all regions of Egypt. The effect that is decreasing over time may be due to the decrease of child's dependence on breastfeeding only.

- The coefficient of CAW showed that current age of woman was positive and significant. This observation was valid for all regions of Egypt at the two time points

of the study. The highest coefficient of CAW in 1980 was among the target women in UG. It showed that a one-year increase in woman's current age would increase, on average, her fertility by about one-fifth of a child in 1980, keeping other things constant. The corresponding coefficients in 2000 showed an increase in the fertility level by about one-third of a child, for one more year in a woman age, keeping other things constant.

- The coefficient of wife's education and husband's education was negative. This observation was valid for all regions of Egypt with high level of significance in almost all regions.
  It's noted that getting primary certificate had its effect on fertility in 1980, but the effect was less in 2000. i.e. having a primary certificate had less effect on fertility in 2000 than in 1980. Wife's education had its highest effect in RL, and husband's education had its highest effect in Lower Egypt.

- Women's work status before marriage had significant impact only in 2000. This was evident in all regions. It had its highest effect in Lower Egypt.

- In urban Governorates the percentage of explanation of the models increased from about 51.3% in the base year of study, to about 78.3% in the comparable year. This trend was valid for all regions.

Table (3.5)
Results of Applying The Multiple Regression of Children Ever Born (CEB) on the Explanatory Variables, among the Target Women, by Region of Residence, EFS (1980) and EDHS (2000)
(Unstandardized coefficient)

Socioeconomic and Proximate Fertility Variables	Region of residence			
	UG		UL	
	1980	2000	1980	2000
Age at First Marriage. AFM	-0.250**	-0.314**	-0.244**	-0.317**
Duration of Breastfeeding	-0.151**	-0.016**	-0.097**	-0.014**
Current age of woman. CAW	0.220**	0.328**	0.207**	0.325**
Wife's Education	-0.447**	-0.091*	-0.840**	-0.062
Husband's Education	-0.186*	-0.149**	-0.317**	-0.186**
Woman's work before marriage	0.069	-0.194**	0.095	-0.230**
Constant	2.541**	0.835**	2.707**	0.967**
Total Explanation (R^2)	51.3	78.3	49.3	77.8
	UU		RL	
Socioeconomic and Proximate Fertility Variables	**1980**	**2000**	**1980**	**2000**
Age at First Marriage. AFM	-0.242**	-0.321**	-0.242**	-0.318**
Duration of Breastfeeding	-0.085**	-0.015**	-0.096**	-0.014**
Current age of woman. CAW	0.204**	0.322**	0.201**	0.319**
Wife's Education	-0.758**	-0.091*	-0.782**	-0.190**
Husband's Education	-0.338**	-0.167**	-0.422**	-0.184**
Woman's work before marriage	0.128	-0.155**	0.014	-0.201**
Constant	2.697**	1.131**	2.809**	1.240**
Total Explanation (R^2)	49.8	77.5	50.7	76.8
	Region of residence			
	RU		All Egypt	
Socioeconomic and Proximate Fertility Variables	**1980**	**2000**	**1980**	**2000**
Age at First Marriage. AFM	-0.243**	-0.291**	-0.245**	-0.313**
Duration of Breastfeeding	-0.082**	-0.016**	-0.162**	-0.014**
Current age of woman. CAW	0.199**	0.294**	0.206**	0.320**
Wife's Education	-0.698**	-0.049	-0.752**	-0.084
Husband's Education	-0.391**	-0.122*	-0.349**	-0.083
Woman's work before marriage	0.103	-0.181**	0.141	-0.190**
Constant	2.880	1.152**	2.709**	0.993**
Total Explanation (R^2)	51.6	74.5		77.3

**:- significant at level 0.01
*:- Significant at level 0.05

3.5 Degree of the Importance of the Variables:-

Table (3.6) represents the regional differentials in the degree of the importance of each variable in 1980 and 2000. The coefficients in this table are standardized partial regression coefficients (beta). It can be used as a measure of the standardized fertility effects of the variables to measure the importance of each variable on fertility at each point of time of the study. This table shows that :-

- Age at first marriage (AFM) was the proximate variable in determining fertility level in all regions of Egypt, at the two points of time of the study. It had a highly significant fertility effect.

- Duration of breastfeeding (DB) was the proximate variable in determining fertility level in all regions of Egypt in 2000. But it had the fourth order in 1980 except in UG which had the second order.

- Wife's getting primary certificate had the effect on fertility in all regions of Egypt in 1980 except in UG where it was the third variable that affected fertility significantly.

- Husband's education was the third variable that affected fertility significantly in all regions of Egypt at the two points of time of the study, except in UG in the base year 1980 and RL and RU in the comparable year 2000.

- Women's work experience before marriage was the variable that affected fertility significantly in all regions of Egypt in the comparable year (2000), and it was highly significant, except in RL (the fifth order) and in RU (the third order), while in 1980 it had an insignificant effect.

Table (3.6)

Results of Applying The Multiple Regression of Children Ever Born (CEB) on the Explanatory Variables, among the Target Women, by Region of Residence, EFS(1980) and EDHS(2000)(Standardized coefficient)

Proximate Fertility Variables	Regions of Residence					
	UG		UL		UU	
	(EFS) 1980	(EDHS) 2000	(EFS) 1980	(EDHS) 2000	(EFS) 1980	(EDHS) 2000
Age at First Marriage	-0.310**	-0.538**	-0.320**	-0.572**	-0.321**	-0.595**
Current age of Women	0.659**	0.831**	0.620**	0.830**	0.619**	0.831**
Duration of Breastfeeding	-0.049**	-0.053**	-0.031**	-0.045**	-0.028**	-0.051**
Wife's Education	-0.042**	-0.022*	-0.093**	-0.015	-0.089**	-0.022*
Husband's Education	-0.027**	-0.032**	-0.049**	-0.040**	-0.054**	-0.036**
Women Work Experience Before Marriage	0.010	-0.031**	0.013	-0.039**	0.018	-0.027**
Proximate Fertility Variables	RL		RU		All Egypt	
	(EFS) 1980	(EDHS) 2000	(EFS) 1980	(EDHS) 2000	(EFS) 1980	(EDHS) 2000
Age at First Marriage	-0.335**	-0.592**	-0.337**	-0.670**	-0.325**	-0.584**
Current age of Women	0.606**	0.807**	0.610**	0.886**	0.622**	0.831**
Duration of Breastfeeding	-0.030**	-0.046**	-0.027**	-0.064**	-0.036**	-0.049**
Wife's Education	-0.103**	-0.044**	-0.093**	-0.014	-0.089**	-0.021*
Husband's Education	-0.072**	-0.038**	-0.068**	-0.029**	-0.056**	-0.041**
Women Work Experience Before Marriage	0.002	-0.033**	0.015	-0.044**	0.013	-0.033**

Source:- (1) Calculated from, 1983, the Egyptian Fertility Survey , 1980.

(2) Calculated from clean tape of EDHS, 2000.

Note:- Values in this Table Represent the Standardized Regression Coefficients (Beta)

* :- Significant at Level 0.05

** :- Significant at Level 0.01

CHAPTER IV

Direct Effect and its Trends on Proximate Variables

In this chapter, we attempt to examine the socio-economic determinants of woman's age at first marriage AFM, and analyze the socio-economic determinants of current use of contraceptives. This chapter contains two types of analysis: firstly, an analysis of differentials in AFM according to some selected socio-economic variables available in 1980 and 2000 surveys. Also an analysis of the differentials which took place during the study period in proportion of currently using any contraceptive method among currently married women (CUSE) according to some selected socio-economic variables available in 1980 and 2000 surveys. Secondly, multi-variant analysis of the impact of each socio-economic variable (as independent variables) on AFM (as a dependent variable). Moreover the logistic regression model is employed to study the effect of independent variables on current use (CUSE) and duration of breastfeeding for child before last (DB).

4.1 Regional Differentials in Mean Age at First Marriage (MAFM)

Table (4.1) represents the regional differentials which occurred during the study period in the mean age at first marriage MAFM. It shows that:-

Mean age at first marriage increased in all regions of Egypt during the study period. The highest increase was among women in UU. The percentage of increase was about 16.6. The least increase in the mean age at first marriage MAFM was observed among rural women. The percentages of increase were about 7.7 and 7.4 in RL and RU respectively. These low percentages of increase may be attributed to the traditional values, norms and the social pressures, which work against increasing woman's age at first marriage.

Table (4.1)
The Regional Differentials in the Mean Age at First Marriage,
EFS (1980) and EDHS (2000).

Region of residence		EFS (1980)	EDHS (2000)	% of Change
Urban Governorates	**UG**	18.46 (4.3)	20.71 (4.5)	12.19
Urban Lower Egypt	UL	18.28 (4.0)	20.13 (3.9)	10.12
Urban Upper Egypt	**UU**	17.05 (3.9)	19.88 (4.4)	16.60
Rural Lower Egypt	**RL**	16.94 (3.4)	18.24 (3.6)	7.67
Rural Upper Egypt	**RU**	16.08 (3.2)	17.27 (3.4)	7.40
All Egypt		17.24 (3.8)	18.92 (4.1)	9.74

Sources:- (1) Calculated from 1980, the Egyptian Fertility Survey, 1980.
(2) Calculated from El-Zanaty., et., Al. EDHS-2000.
- Standard Deviation in Parentheses

4.2 Socio-economic Differentials in Mean Age at First Marriage (MAFM).

Table (4.2) represents the differentials in the mean age at first marriage according to some selected socio-economic variables in all regions. This table shows that:-

- Woman's education had a positive impact on mean age at first marriage (MAFM). This observation agrees with the hypothetical effect of woman's education on AFM (better educated women marry later than less educated women, because of the longer school years). The second group of women had higher mean age at first marriage (MAFM) than the first group. This observation was valid for all regions of Egypt at the two points of time on the study. All the values of MAFM achieved a raise during the study period, except in UL and UU, where the change in MAFM decreased for the second group of women, where women had any certificate. The highest raise in MAFM occurred among women of the first group in UU. The percentage of raise was about 8% among women of the first group. The least raise was about 1.8% among women of the second group in UG. The increase that occurred during the study period in the absolute difference between MAFM of the first and second education groups, may reflect the increase (which occurred throughout the study period) in the importance of education. The impact of education on MAFM was higher in 1980 (4 years) than in 2000 (3 years). This trend was valid for all regions of Egypt. The highest impact of education on the MAFM occurred among women in Urban Upper Egypt. The difference in MAFM between educated and uneducated women was 5 years in 1980. The least impact of education on MAFM in 2000 occurred among women in RU. The difference in MAFM between educated and uneducated woman was 1.6 years.

- Husband's education had a positive impact on MAFM. Wife of the educated husband had a higher age at first marriage than other wives. The increase in MAFM for wives of educated husbands between 1980 and 2000 was highest in UU Egypt. The percentage of increase was about 7.3% . The least percentage was about 2.1% in RL. The absolute difference between MAFM of the first and second education groups, may reflect the importance of education. The impact of education on MAFM was higher in 1980 (2.8 years) than in 2000 (2.6 years). This trend was valid in UG and RL. The highest impact of education

on the MAFM occurred among husbands in UU Egypt. The difference in MAFM between educated and uneducated husbands was (3.4 years in 2000). The least impact of education on MAFM occurred among husbands in RU in 1980, (0.95 years).

- Woman's work experience before marriage had a positive impact on her AFM and this trend was valid in all regions and in the two years under study except in RU, 1980. The increase in MAFM between 1980 and 2000 for women who worked before marriage was highest in RU Egypt. The percentage of increase was about 22.5%, (3.6 years). The impact of work experience before marriage on MAFM was higher in 2000 (3.6 years) than in 1980 (2.2 years). This trend was valid in RL and RU. The highest impact of work experience before marriage on MAFM occurred among women in UU Egypt. The difference in MAFM between women (worked and not worked) was 5.4 years in 1980. The least impact of work experience before marriage on MAFM occurred among women in RL, (0.8 years in 1980).

- Blood relation between couples had a negative impact on MAFM. MAFM was higher among those with no relation between couples than others. This observation was valid for almost all regions of Egypt. The increase in MAFM between 1980 and 2000 for women with blood relation was highest in UU. The percentage of increase was about 16% (2.5 years). The impact of blood relation on MAFM was higher in 2000, (-1.2 years) than in 1980, (-0.92 years). This trend was valid for all regions of Egypt except in RL. The highest reduction of blood relation on MAFM occurred among women in UG. The difference in MAFM between relation and not relation was (-1.8 years) in 2000. The least reduction of blood relationship on MAFM occurred among women in RL, 2000. The difference in MAFM between (relation and not relation) women was (- 0.21 years).

Table (4.2)

Mean Age at First Marriage, by Some Selected Socio-economic Variables

Socio-economic Variables	Regions of Residence								
	UG			UL			UU		
	(EFS) 1980	(EDHS) 2000	% of Change	(EFS) 1980	(EDHS) 2000	% of Change	(EFS) 1980	(EDHS) 2000	% of Change
Woman's Education									
Less than Primary	17.47	18.08	3.49	17.29	18.04	4.34	16.14	17.47	8.24
Primary and Above	21.15	21.54	1.84	21.17	20.87	-1.42	21.21	20.85	-1.69
Change	3.68	3.46	-5.98	3.88	2.83	-27.06	5.07	3.38	-33.33
Husband's Education									
Less than Primary	17.18	18.26	6.29	17.17	17.72	3.20	16.12	17.13	6.27
Primary and Above	20.18	21.21	5.10	19.81	20.73	4.64	19.18	20.57	7.25
Change	3.0	2.95	-1.57	2.64	3.01	14.02	3.06	3.44	12.4
Woman's Work Before Marriage									
Worked	22.17	23.58	6.36	22.01	22.72	3.23	21.77	23.38	7.39
Not Worked	17.69	19.64	11.02	17.56	19.50	11.05	16.40	19.00	15.85
Change	4.48	3.94	-12.05	4.45	3.22	-27.64	5.37	4.38	-18.44
Blood-relationship Between Spouse									
There is a relationship	17.48	19.43	11.16	17.79	19.39	8.99	16.36	18.93	15.71
No Relationship	18.98	21.23	11.26	18.49	20.38	10.22	17.59	20.40	15.97
Change	-1.5	-1.8	20.0	-0.7	-0.99	41.43	-1.23	-1.47	19.51

Sources:- (1) Calculated from 1980, the Egyptian Fertility Survey, special Tabulations.
(2) Calculated from El-Zanaty., et., Al. EDHS-2000.

Table (4.2) Continued

Socio-economic Variables	Regions of Residence								
	RL			RU			All Egypt		
	(EFS) 1980	(EDHS) 2000	% of Change	(EFS) 1980	(EDHS) 2000	% of Change	(EFS) 1980	(EDHS) 2000	% of Change
Woman's Education									
Less than Primary	16.76	17.31	3.28	16.05	16.66	3.80	16.71	17.23	3.11
Primary and Above	19.73	19.26	-2.38	17.79	18.30	2.87	20.82	20.20	-2.98
Change	2.97	1.95	-34.34	1.74	1.64	-5.75	4.11	2.97	-27.74
Husband's Education									
Less than Primary	16.63	17.25	3.73	15.99	16.49	3.13	16.55	17.13	3.50
Primary and Above	18.43	18.82	2.12	16.94	17.82	5.19	19.31	19.68	1.92
Change	1.8	1.57	-12.78	0.95	1.33	40.0	2.76	2.55	-7.61
Woman's Work Before Marriage									
Worked	17.56	19.54	11.28	15.99	19.59	22.51	19.05	21.97	15.33
Not Worked	16.76	18.04	7.64	16.09	17.12	6.40	16.87	18.34	8.71
Change	0.8	1.5	87.5	-0.1	2.47	2570.0	2.18	3.63	66.51
Blood-relationship Between Spouse									
There is a relationship	16.73	18.10	8.19	16.12	17.10	6.08	16.72	18.16	8.61
No Relationship	17.08	18.31	7.20	16.02	17.46	8.98	17.64	19.37	9.81
Change	-0.35	-0.21	-40.0	0.1	-0.36	-460.0	-0.92	-1.21	31.52

Sources:- (1) Calculated from 1980, the Egyptian Fertility Survey, special Tabulations.
(2) Calculated from El-Zanaty., et., Al. EDHS-2000

4.3 The Correlation Matrix between the variables.

Tables (4.3.A) and (4.3.B) represent the bi-variate correlation matrix of the variables, at the two points of time of the study 1980 and 2000. These tables show that:-

- The correlation coefficients between AFM (the dependent variable) and all the independent variables were statistically significant at level (0.01). This observation was valid for Egypt as a whole at the two points of time in the study, with few exceptions among regions.

- Correlation coefficients between AFM and woman's and husband's education were significant in all regions of Egypt at the two points of time of the study.

- Correlation coefficients between AFM and woman's work experience before marriage (WEWBM) was significant in all regions in the base year of the study except in RU, and significant in all regions in the comparable year of the study.

- Correlation coefficients between AFM and blood relation were significant in all regions of Egypt at the two points of time of the study except in RU in 1980.

- The highest correlation coefficient among the independent variables was about (0.58) between husband's education and wife education in UU in 1980. Such not strong correlation will not cause serious multi-collinearity problems.

able (4.3.A)
Bi-variate Correlation Matrix of the Variables, According to Region of Residence, (EFS) 1980

Variables	AFM	W.Edu	H.Edu	WEWBM	B.relat
UG					
Age at first marriage	1.000	0.377**	0.345**	0.391**	-0.166**
Wife's education		1.000	0.512**	0.340**	-0.152**
Husband's education			1.000	0.239**	-0.106**
Woman's ever work before marriage				1.000	-0.140**
Blood relationship					1.000
UL					
Age at first marriage	1.000	0.421**	0.324**	0.408**	-0.079*
Wife's education		1.000	0.496**	0.376**	-0.180
Husband's education			1.000	0.213**	-0.001
Woman's ever work before marriage				1.000	-0.065*
Blood relationship					1.000
UU					
Age at first marriage	1.000	0.492**	0.356**	0.441**	-0.154**
Wife's education		1.000	0.580**	0.405**	-0.164**
Husband's education			1.000	0.248**	-0.041
Woman's ever work before marriage				1.000	-0.120**
Blood relationship					1.000
RL					
Age at first marriage	1.000	0.205**	0.197**	0.096**	-0.49**
Wife's education		1.000	0.410**	0.070**	-0.022
Husband's education			1.000	-0.040*	-0.013
Woman's ever work before marriage				1.000	-0.340
Blood relationship					1.000
RU					
Age at first marriage	1.000	0.073**	0.088**	-0.010	0.014
Wife's education		1.000	0.267**	0.008	0.190
Husband's education			1.000	-0.450*	0.076**
Woman's ever work before marriage				1.000	0.014
Blood relationship					1.000
All Egypt					
Age at first marriage	1.000	0.360**	0.313**	0.215**	-0.120**
Wife's education		1.000	0.516**	0.206**	-0.117**
Husband's education			1.000	0.089**	-0.077**
Woman's ever work before marriage				1.000	-0.067**
Blood relationship					1.000

Source:- Calculated from 1980, the Egyptian Fertility Survey,1980.

** :- Significant at Level .01

*:- Significant at Level .05

Table (4.3.B)
Bi-variate Correlation Matrix of the Variables, According to Region of Residence, (EDHS) 2000

Variables	AFM	W.Edu	H.Edu	WEWBM	B.relat
UG					
Age at first marriage	1.000	0.331**	0.250**	0.394**	-0.184**
Wife's education		1.000	0.464**	0.232**	-0.137**
Husband's education			1.000	0.176**	-0.033
Woman's ever work before marriage				1.000	-0.170**
Blood relationship					1.000
UL					
Age at first marriage	1.000	0.313**	0.300**	0.321**	-0.107**
Wife's education		1.000	0.497**	0.162**	-0.042
Husband's education			1.000	0.133**	-0.015
Woman's ever work before marriage				1.000	-0.083**
Blood relationship					1.000
UU					
Age at first marriage	1.000	0.350**	0.315**	0.402**	-0.162**
Wife's education		1.000	0.475**	0.255**	-0.085**
Husband's education			1.000	0.186**	-0.008
Woman's ever work before marriage				1.000	-0.112**
Blood relationship					1.000
RL					
Age at first marriage	1.000	0.275**	0.214**	0.143**	-0.028*
Wife's education		1.000	0.483**	0.049**	-0.022
Husband's education			1.000	0.001	0.013
Woman's ever work before marriage				1.000	-0.043**
Blood relationship					1.000
RU					
Age at first marriage	1.000	0.232**	0.192**	0.172**	-0.052**
Wife's education		1.000	0.383**	0.103**	-0.041*
Husband's education			1.000	0.054**	-0.001
Woman's ever work before marriage				1.000	-0.022
Blood relationship					1.000
All Egypt					
Age at first marriage	1.000	0.360**	0.286**	0.325**	-0.144**
Wife's education		1.000	0.490**	0.190**	-0.108**
Husband's education			1.000	0.124**	-0.041**
Woman's ever work before marriage				1.000	-0.115**
Blood relationship					1.000

(2) Calculated from El-Zanaty., et., Al. EDHS-2000.

** :- Significant at Level .01

*:- Significant at Level .05

4.4 Socio-economic Determinants of AFM:

4.4.1 Model Specification and Measurement of the Variables:

The multiple regression equation, will be as follows:

$$\mathbf{AAFM = a + b_1\, BRS_i + b_2\, WEDU_i + b_3\, WWEBM_i + b_4\, HEDU_i + e_i}$$

Where:

AAFM :- denotes age at first marriage (dependent variable, measured by complete years).

BRS :- denotes Blood-relationship between spouses (a binary variable that takes the value 1 if there is any relationship and the value 0 otherwise).

WEDU :- denotes woman's education (a binary variable that takes the value 1 if she has any education certificate and the value 0 otherwise).

WWEBM:- denotes woman's work experience before marriage (a binary variable, that takes the value 1 if she worked before marriage and the value 0 otherwise).

HEDU :- denotes husband's education (a binary variable, that takes the value 1 if he has any education certificate and the value 0 otherwise).

a :- is a coefficient representing the intercept (AAFM when all the independent variables are set to zero).

b_1 :- is a coefficient representing the effect of the blood-relationship between spouses on AAFM.

b_2 :- is a coefficient representing the effect of the woman's education WEDU on AAFM.

b_3 :- is a coefficient representing the effect of the woman's Work experience before marriage WWEBM on AAFM.

b_4 :- is a coefficient representing the effect of the husband's education HEDU on AAFM.

e_i :- denotes random error for ith individual.

4.4.2 Quantitative Measures of the Impact of Socio-economic variables on AFM:-

In this part we apply the ordinary least squares multiple regression analysis on the previous equation to investigate the effect of each independent variable on AFM.

Table (4.4) represents the results of applying the multiple regression of the socioeconomic variables on AFM, among the target women, at the regional level, in 1980 (EFS) and 2000 (EDHS). The table contains unstandardized partial regression coefficients measuring the net effect of the socioeconomic variables on AFM. This table shows that:-

- The coefficient of woman's education, woman's work experience before marriage, and husband's education was positively related to AFM. This observation was significant and valid for all regions of Egypt at the two time points of the study. The highest coefficient of wife's education in 1980 showed that having any education certificate would increase on average her AFM by about three years, keeping other things constant in UG. The corresponding coefficients in 2000 showed an increase in AFM by about two years in RL, keeping other things constant. In general, the effect of women's education on AFM is decreasing overtime.

- The highest coefficient of woman's work experience before marriage, showed that woman's work before marriage would increase on average her AFM by about 3.3 years, keeping other things constant in RL in 2000. The effect of work experience on AFM is increasing overtime.

- The coefficient of blood relation between couples reveals that there is a negative relation between blood relation and wife's AFM. This observation was significant and valid for all regions of Egypt at the two time points of the study. The effect of this observation was the highest in RL. The effect of blood relation on AFM is increasing overtime.

- In urban governorates the percentage of explanation of the models increased from aboutb12.9% in the base year of study, to about 18.2% in the comparable year. This observation was valid for regions as a whole.

Table (4.4)
Results of Applying The Multiple Regression of Age at First Marriage (AFM), by Region of Residence, EFS(1980) and EDHS(2000) (Unstandardized Coefficient)

	Region of residence			
	UG		UL	
Socioeconomic Variables	1980	2000	1980	2000
Wife's Education	2.820**	1.779**	2.625**	1.931**
Husband's Education	1.312**	1.150**	1.570**	1.135**
Woman's work before marriage	1.074**	2.475**	1.341**	2.863**
Blood Relationship	-0.407**	-0.588**	-0.511**	-0.673**
Constant	16.37**	16.70**	16.45**	16.75**
Total Explanation (R^2)	12.9	18.2	16.0	21.3
	UU		RL	
Socioeconomic Variables	1980	2000	1980	2000
Wife's Education	2.574**	1.943**	2.588**	2.013**
Husband's Education	1.597**	1.129**	1.590**	1.338**
Woman's work before marriage	1.381**	2.722**	2.028**	3.273**
Blood Relationship	-0.530**	-0.679**	-0.645**	-0.940**
Constant	16.52**	16.79**	16.50**	16.83**
Total Explanation (R^2)	16.9	20.8	22.2	26.2
	RU		All Egypt	
	1980	2000	1980	2000
Wife's Education	2.477**	1.970**	2.641**	1.949**
Husband's Education	1.544**	1.299**	1.550**	1.208**
Woman's work before marriage	1.826**	2.733**	1.493**	2.835**
Blood Relationship	-0.562**	-0.662**	-0.538**	-0.715**
Constant	16.62**	16.95**	16.49**	16.79**
Total Explanation (R^2)	20.1	21.4	17.7	21.9

**:- Significant at level 0.01
*:- significant at level 0.05

4.5 Differentials in Current use of Contraceptives (CUSE) According to region of residence:-

Table (4.5) represents the regional differentials which took place during the study period in the percentage of current use of any contraceptive method among currently married women (cuse). This table shows that:-

Level of current use was positively related to the level of development of the regions. The highest level of current use in 1980 was among women in UG (the highest developed region in Egypt). While the least level of current use was in RU (the least developed region in Egypt). A substantial increase occurred during the study period in the level of current use in all regions of Egypt. The percentage of increase in the level of current use was negatively related to the level of 1980 use in the region. The regional differentials in the level of current use narrowed down between 1980 and 2000, because regions with initially lower levels in 1980 were able to achieve faster increase than the regions with initially higher levels. They also indicate the pressure that was made during the study period to increase the level of contraception in the less developed regions of Egypt.

Table (4.5)
The Regional Differentials in the Proportion of Currently Using Any Contraceptive method among Currently Married Women (CUSE) EFS (1980) and EDHS (2000).

Region of residence		EFS (1980)	EDHS (2000)	% of Change
Urban Governorates	UG	43.8	62.7	43.2
Urban Lower Egypt	UL	42.9	64.9	51.3
Urban Upper Egypt	UU	25.1	55.4	120.7
Rural Lower Egypt	RL	18.0	61.4	241.1
Rural Upper Egypt	RU	4.1	40.2	880.5
All Egypt		24.1	56.2	133.2

Sources:- (1) Calculated from, 1980, the Egyptian Fertility Survey, 1980.
(2) Calculated from, El-Zanaty., et., Al. EDHS-2000 reports.

4.6 Socio-economic Differentials in Current use of Contraceptives (CUSE):-

Table (4.6) represents the differentials in current use of contraceptives (CUSE) according to some selected socio-economic variables in all regions. This table shows that:-

- Woman's education had a positive impact on contraceptive use. This observation was valid for all regions of Egypt at the two time points of the study except in RL in the year 2000. All the values of contraceptive use for the uneducated women as well as the educated achieved a raise during the study period. The highest raise in contraceptive use among educated and less educated women occurred in RU. The percentage of raise was about 221% for educated and 1061% for less educated women. The least raise for educated women was about 16% in UG. The impact of education on contraceptive use was lower in 2000, 7%, than in 1980, 29%. This observation was valid for all regions of Egypt. The highest impact of education on contraceptive use occurred among women in UU. The difference in (CUSE) between educated and uneducated women was 24% in 1980. The least impact of education on (CUSE) in 2000 occurred among women in UG. The difference between educated and uneducated women was 3.5%.

- Husband's education had a positive impact on contraceptive use. This observation was valid for all regions of Egypt at the two time points of the study except in RL in the year 2000. All the values of contraceptive use for the uneducated husbands as well as the educated achieved a raise during the study period. The highest raise in contraceptive use among educated and less educated husbands occurred in RU. The percentage of raise was about 530% and 1257% respectively. The least raise for educated husbands was about 28% in UG. The impact of education on contraceptive use was lower in 2000, 5%, than in 1980, 21%. This observation was valid for all regions of Egypt except in RU. The highest impact of education on contraceptive use occurred among husbands in UG. The difference in (CUSE) between educated and uneducated husbands was 22% in 1980. The least impact of education on (CUSE) occurred among husbands in UG and UL in 2000. The difference between educated and uneducated husbands was 2% .

- Woman's work status had a positive impact on (CUSE). This observation was valid for all regions of Egypt at the two time points of the study. All the values of (CUSE) for the working and not working women achieved a raise during the study period. The highest raise in (CUSE) among working women occurred in RU. The percentage of raise was about 1129%. The least raise for working women was about 31% in UG. The impact of working women on (CUSE) was lower in 1980, 6% than in 2000, 11%. This observation was valid for all regions except in UG and UU. The highest impact of work on (CUSE) occurred among women in UU. The difference between working and not working women was 15% in 1980. The least impact of work on (CUSE) occurred among women in RU in 1980. The difference between working and not working women was about 1% .

Table (4.6)
Differentials in the Percentage of Currently Using Any Contraceptive method among Currently Married Women According to Some Selected Socio-economic Variables, by Region, (EFS, 1980) and (EDHS, 2000).

Socio-economic Variables	Region of Residence								
	UG			UL			UU		
	(EFS) 1980	(EDHS) 2000	% of Change	(EFS) 1980	(EDHS) 2000	% of Change	(EFS) 1980	(EDHS) 2000	% of Change
Woman's Education									
Less than Primary	35.0	60.7	73.4	37.3	62.7	68.1	18.2	51.2	181.3
Primary and Above	55.2	64.2	16.3	51.2	66.6	30.1	41.8	59.1	41.4
Chang	20.2	3.5	-82.7	13.9	3.9	-71.9	23.6	7.9	-66.5
Husband's Education									
Less than Primary	27.9	61.5	120.4	31.7	63.7	100.9	14.5	49.6	242.1
Primary and Above	49.5	63.4	28.1	47.8	65.7	37.4	35.7	58.8	64.7
Chang	21.6	1.9	-91.2	16.1	2.0	-87.6	21.2	9.2	-56.6
Woman's Work Status									
Working	51.5	67.4	30.9	46.5	71.8	54.4	37.8	64.5	70.6
Not Working	42.2	61.5	45.7	42.2	62.9	49.1	23.3	53.2	128.3
Chang	9.3	5.9	-36.6	4.3	8.9	106.9	14.5	11.3	-22.1

Sources:- (1) Calculated from 1980, the Egyptian Fertility Survey, special Tabulations.
(2) Calculated from El-Zanaty., et., Al. EDHS-2000.

Table (4.6) Continued

Socio-economic Variables	Regions of Residence								
	RL			RU			All Egypt		
	(EFS) 1980	(EDHS) 2000	% of Change	(EFS) 1980	(EDHS) 2000	% of Change	(EFS) 1980	(EDHS) 2000	% of Change
Woman's Education									
Less than Primary	15.7	62.9	300.6	3.3	38.3	1060.6	17.5	53.6	206.3
Primary and Above	32.8	58.3	77.7	14.8	47.5	220.9	46.0	60.3	31.1
Chang	17.1	-4.6	-126.9	11.5	9.2	-20.0	28.5	6.7	-76.5
Husband's Education									
Less than Primary	14.5	62.1	328.3	2.8	38.0	1257.1	13.4	53.6	300.0
Primary and Above	22.1	60.5	173.8	7.0	44.1	530.0	34.2	58.9	72.2
Chang	7.6	-5.5	-172.4	4.2	6.1	45.2	20.8	5.3	-74.5
Woman's Work Status									
Working	18.9	66.0	348.9	4.2	51.6	1128.6	26.1	65.8	152.1
Not Working	14.7	60.5	220.1	3.3	39.4	1093.9	23.7	54.4	129.5
Chang	4.2	5.5	30.9	0.9	12.2	1255.6	5.7	11.4	100.0

Sources:- (1) Calculated from 1980, the Egyptian Fertility Survey, special Tabulations.
(2) Calculated from El-Zanaty., et., Al. EDHS-2000.

4.7 The Correlation Matrix between the variables.

Tables (4.7.A) and (4.7.B) represent the bi-variate correlation matrix of the variables, at the two points of time of the study 1980 and 2000. These tables show that:-

- Correlation coefficients between CUSE and woman's and husband's education were significant in Egypt as a whole and all regions of Egypt at the two points of time of the study except in RL in 2000.

- Correlation coefficients between CUSE and woman's work status (WWS) was significant in Egypt as a whole and all regions in the base year of the study except in UL, RU and Egypt as a whole and significant in all regions in the comparable year of the study except in UG, RL.

- The highest correlation coefficient among the independent variables was about (0.64), such not strong correlation will not cause serious multi-collinearity problems.

Table (4.7.A)
Bi-variate Correlation Matrix of the Variables, According to Region of Residence, (EFS) 1980

Variables	CUSE	W.Edu	H.Edu	W.W.S
UG				
Current Use	1.000	0.228**	0.207**	0.073**
Wife's education		1.000	0.319**	0.245**
Husband's education			1.000	0.129**
Woman's work Status				1.000
UL				
Current Use	1.000	0.138**	0.170**	0.020
Wife's education		1.000	0.366**	0.273**
Husband's education			1.000	0.124**
Woman's work Status				1.000
UU				
Current Use	1.000	0.272**	0.264**	0.129**
Wife's education		1.000	0.474**	0.308**
Husband's education			1.000	0.151**
Woman's ever work before marriage				1.000
RL				
Current Use	1.000	0.174**	0.117**	-0.056*
Wife's education		1.000	0.278**	-0.013
Husband's education			1.000	-0.101**
Woman's work Status				1.000
RU				
Current Use	1.000	0.175**	0.109**	-0.019
Wife's education		1.000	0.217**	-0.035
Husband's education			1.000	-0.073**
Woman's work Status				1.000
All Egypt				
Current Use	1.000	0.317**	0.277**	0.021
Wife's education		1.000	0.382**	0.116**
Husband's education			1.000	0.007
Woman's work Status				1.000

Source:- Calculated from 1980, the Egyptian Fertility Survey,1980.
**:- Significant at Level .01
* :- Significant at Level .05

Table (4.7.B)
Bi-variate Correlation Matrix of the Variables, According to Region of Residence, (EDHS) 2000

Variables	CUSE	W.Edu	H.Edu	W.W.S
UG				
Current Use	1.000	0.068**	0.045*	0.023
Wife's education		1.000	0.599**	0.258**
Husband's education			1.000	0.197**
Woman's work Status				1.000
UL				
Current Use	1.000	0.077**	0.046*	0.050*
Wife's education		1.000	0.599**	0.318**
Husband's education			1.000	0.253**
Woman's work Status				1.000
UU				
Current Use	1.000	0.119**	0.124**	0.074**
Wife's education		1.000	0.614**	0.383**
Husband's education			1.000	0.271**
Woman's ever work before marriage				1.000
RL				
Current Use	1.000	-0.003	0.024	0.009
Wife's education		1.000	0.639**	0.122**
Husband's education			1.000	0.068**
Woman's work Status				1.000
RU				
Current Use	1.000	0.089**	0.080**	0.046**
Wife's education		1.000	0.518**	0.209**
Husband's education			1.000	0.105**
Woman's work Status				1.000
All Egypt				
Current Use	1.000	0.092**	0.079**	0.059**
Wife's education		1.000	0.623**	0.262**
Husband's education			1.000	0.180**
Woman's work Status				1.000

Source:- Calculated from 1980, the Egyptian Fertility Survey,1980.
**:- Significant at Level .01
* :- Significant at Level .05

4.8 Determinants of Current Use of Contraceptives

The logistic regression model is employed to study the effect of independent variables on the current use of contraceptives. Table (4.2.4) represents the definition of independent variables under study. The dependent variable is a dummy variable, which equals zero for those who are not using any method and equals one for those who are currently using.

Table (4.8)

Measurement of the Determinants of the Current use

Variables	Measurement
Wife's Education	Two Categories were identified Less than primary = 0 Primary and above = 1
Husband's Education	Two Categories were identified Less than primary = 0 Primary and above = 1
Wife's work status	Two Categories were identified Not working = 0 Currently working = 1
Y "Current use Contraceptives	Two Categories were identified Current use =1 Don't use = 0

Comparative risk

Odds ratio (OR) compares the odds that a disease (or other health-related outcome) will occur among individuals who have a particular characteristic, or who have been exposed to a risk factor to the odds that the disease will occur in individuals who lack the characteristic or who have not been exposed.

The odds (O) that a given outcome will occur is defined as

$$\text{Odds} = \frac{\text{P (outcome will occur)}}{1 - \text{P (outcome will occur)}}$$

∴ The odds that a person is exposed to the risk factor (E +) will have the disease (D +), that is $O_{D+|E+}$ is

$$O_{D+|E+} = \frac{\text{Prob. Of disease if exposed}}{\text{Prob. Of no disease if exposed}}$$

$$\text{OR} = \frac{\text{Odds that exposed individual will have disease}}{\text{Odds that nonexposed individual will have disease}}$$

$$= \frac{O_{D+|E+}}{O_{D+|E-}}$$

$$= \frac{P(D+|E+) / P(D-|E+)}{P(D+|E-) / P(D-|E-)}$$

	Disease D +	No disease D -
Exposed (E +)	a	b
Not exposed (E -)	c	d

$$\text{OR} = \frac{a / b}{c / d}$$

Table (4.9)

Regression Results for Factor Affecting CUSE

Variables	Regions of Residence							
	UG (1980)				UG (2000)			
	B	S.E	Odds Ratio	Prob.	B	S.E	Odds Ratio	Prob.
Wife's Education	0.758**	0.117	2.133	0.681	0.040	0.098	1.041	0.510
Husband's Education	0.712**	0.130	2.038	0.671	0.415**	0.109	1.514	0.602
Wife's Work Status	0.027	0.150	1.027	0.507	0.109	0.089	1.115	0.527
Constant	-0.647**	0.110	0.524	-	-0.114	0.094	0.892	-
Chi-Square X^2	110.4	-	-	-	23.699	-	-	-
% Correctly Classified	62.3	-	-	-	57.5	-	-	-
		-	-	-	-	-	-	-
Variables	UU (1980)				UU (2000)			
	B	S.E	Odds Ratio	Prob.	B	S.E	Odds Ratio	Prob.
Wife's Education	0.800**	0.254	2.225	0.690	0.317**	0.121	1.111	0.586
Husband's Education	0.831**	0.240	2.296	0.697	0.434**	0.136	1.544	0.607
Wife's Work Status	0.186	0.323	1.205	0.546	0.210	0.124	1.234	0.552
Constant	-1.470**	0.177	0.230	-	-0.601**	0.114	0.548	-
Chi-Square X^2	44.04	-	-	-	43.33	-	-	-
% Correctly Classified	70.3	-	-	-	56.4	-	-	-
Variables	All Egypt (1980)				All Egypt (2000)			
	B	S.E	Odds Ratio	Prob.	B	S.E	Odds Ratio	Prob.
Wife's Education	1.171**	0.069	3.226	0.673	0.211**	0.039	1.235	0.553
Husband's Education	0.889**	0.065	2.432	0.709	0.357**	0.042	1.429	0.588
Wife's Work Status	-0.120	0.079	.887	0.470	0.262**	0.046	1.299	0.565
Constant	-1.582**	0.051	0.205	-	-0.367**	0.032	0.693	-
Chi-Square X^2	774.9	-	-	-	253.9	-	-	-
% Correctly Classified	72.6	-	-	-	55.8	-	-	-
		-	-	-		-	-	-

Source:- (1) Calculated from, 1980, the Egyptian Fertility Survey,1980.

(2) Calculated from, EDHS-2000.

**:- Significant at level 0.01

*:- significant at level 0.05

Based on the above results, the logistic regression equation of the likelihood of current use (CUSE) can be written as follows:
Note:-
Y_1 = Current use any method

$$Ln\left[\frac{\rho(\gamma_i)}{1-\rho(\gamma_i)}\right] = -0.647 + 0.758 \text{ wife's education} + 0.712 \text{ husband's education in UG 1980.}$$

$$Ln\left[\frac{\rho(\gamma_i)}{1-\rho(\gamma_i)}\right] = 0.415 \text{ husband's education in UG 2000.}$$

$$Ln\left[\frac{\rho(\gamma_i)}{1-\rho(\gamma_i)}\right] = -1.470 + 0.800 \text{ wife's education} + 0.831 \text{ husband's education in UU 1980.}$$

$$Ln\left[\frac{\rho(\gamma_i)}{1-\rho(\gamma_i)}\right] = -0.601 + 0.317 \text{ wife's education} + 0.434 \text{ husband's education} + 0.210 \text{ wife's work status in UU 2000.}$$

$$Ln\left[\frac{\rho(\gamma_i)}{1-\rho(\gamma_i)}\right] = -1.582 + 1.171 \text{ wife's education} + 0.889 \text{ husband's education in All Egypt 1980.}$$

$$Ln\left[\frac{\rho(\gamma_i)}{1-\rho(\gamma_i)}\right] = -0.367 + 0.211 \text{ wife's education} + 0.357 \text{ husband's education} + 0.262 \text{ wife's work status in All Egypt 2000.}$$

Table (4.9) explores current use of contraceptives (CUSE) and represents the logistic regression results of likelihood of contraceptives. The table illustrates that the effects of wive's education who have a primary certificate or higher are significant at level 0.01 with higher odds 2 times compared to those who have less than primary certificate in UG in 1980, and the effects of husbands' education who have a primary certificate or higher are significant at level 0.01 with higher odds 2 times compared to those who have less than primary certificate in UG in 1980.

In UG, 2000 having a primary certificate for wives was not enough to have a significant effect on family planning practice. Wife's work status was accompanied by insignificant increase in current use of contraception in 1980 and 2000. The model is correctly classified, i.e. a total of 62% out of a total number of cases in 1980 and 57% in 2000.

1980

Observed		Predicted		
		Currently Using Any Method		Percentage
		No	Yes	Correct
Currently Using Any Method	No	209	462	31.1
	Yes	104	728	87.5
Overall Percentage				62.3

2000

Observed		Predicted		
		Currently Using Any Method		Percentage
		No	Yes	Correct
Currently Using Any Method	No	258	1074	19.4
	Yes	245	1525	86.2
Overall Percentage				57.5

Also the table illustrates that the effects of wive's and husbands' education who have a primary certificate or higher are significant at level 0.01 with higher odds 2 times compared to those who have less than primary certificate in UU in 1980, but the effects of wive's and husbands' education are less than 2 times compared to those who have less than primary certificate in UU in 2000. Wife's work status in UU was accompanied by insignificant increase in current use of contraception in 1980 and 2000. The model is correctly classified, i.e. a total of 70% and 56% out of a total number of cases in 1980 and 2000 respectively.

1980

Observed		Predicted		
		Currently Using Any Method		Percentage
		No	Yes	Correct
Currently Using Any Method	No	241	50	82.8
	Yes	80	66	45.2
Overall Percentage				70.3

2000

Observed		Predicted		
		Currently Using Any Method		Percentage
		No	Yes	Correct
Currently Using Any Method	No	356	532	40.1
	Yes	257	663	72.1
Overall Percentage				56.4

Also the table illustrates that the effects of wive's and husbands' education who have a primary certificate or higher in Egypt as a whole are significant at level 0.01% with higher odds 3 and 2 times respectively compared to those who have less than primary certificate. But obtaining a primary certificate for wife and husband had less odds ratio in 2000 than in 1980. Wife's work status was accompanied by significant increase in current use of contraception and probability of increasing CUSE about 57% in 2000. The model is correctly classified, i.e. a total of 73% out of a total number of cases in 1980 and 56% in 2000. The model fails to classify UL, RL and RU regions.

1980

Observed		Predicted		
		Currently Using Any Method		Percentage
		No	Yes	Correct
Currently Using Any Method	No	3624	500	87.9
	Yes	1160	778	40.1
Overall Percentage				72.6

2000

Observed		Predicted		
		Currently Using Any Method		Percentage
		No	Yes	Correct
Currently Using Any Method	No	3751	3384	52.6
	Yes	3080	4408	58.9
Overall Percentage				55.8

CHAPTER V
SUMMARY AND RECOMMENDATIONS

5.1 *Summary:-*

The following are the main finding of the study:

Levels, Trends, And Differentials Of Current Fertility And Its Proximate Determinants

Fertility level of Egypt as a whole achieved a substantial reduction through the period of study. The highest reduction in current fertility level occurred among those who lived in UU and RL. The least reduction occurred in UG. The highest reduction in ASFRs occurred among women in the first and last age groups (15-19, 45-49) of reproductive period. The reduction of the first age group may have occurred as a result of increasing mean age at first marriage, where it increased from about 17.2 years in 1980 to reach about 19.5 years in 2000. The reduction of the last age group may have occurred by the effect of using contraceptives for limitation.

Egypt has achieved a great success in promoting contraceptive use, where the proportion of currently married women currently using contraceptives increased throughout the study period, while the least increase was in RU. Women aged 30-44 had the highest level of family planning practice at the two points of time of the study. Women tend to use contraceptives at the later ages of their reproductive life, after they have achieved their desired family size. The highest percentages of increase in the level of contraceptive use is concentrated among women in the first three age groups (15-29). This phenomenon may reflect an improvement in the attention of women to use family planning for spacing between births. In general the regional differentials in the level of contraceptive use narrowed down in 2000 compared with 1980

because regions with initially lower levels in 1980 were able to achieve much faster increase than the regions with initially higher levels.

Mean duration of breastfeeding was higher in rural areas than urban areas of Egypt. The percentage of change increases as the age of mother increases. This observation may represent a new and desired lactation behavior. It may have occurred as a result of increasing knowledge and information of mother about the importance of breastfeeding for the health of children, and its importance as a supplementary method of contraception, especially in the first few months after birth.

Mean duration of breastfeeding increases as the age of mother increases (older women in reproductive span tend to breastfeed their children for a longer period than younger women). This observation was valid for all regions.

Direct and Indirect Effect on Fertility and its Trend:-

All the values of MCEB achieved a reduction during the study period, except in RU. The highest reduction in the MCEB occurred among women age at first marriage was 18 years and above in RL.

At the national level, breastfeeding for 6 months and over had higher number of MCEB than less than 6 months which was not expected. It is the opposite of the theoretical effect of breastfeeding on fertility. Our construction of this phenomenon is that, most women who breastfeed for a short time are highly educated (secondary level and higher) and working women. They are more likely to use an effective method of contraception after a short time of giving birth to control their fertility than women who breastfeed for longer duration.

The highest reduction in the MCEB between 1980 and 2000 was observed among ever users and never users of contraceptives in RL Egypt. The least reduction was in RU Egypt.

Uneducated women have greater mean number of children ever born (MCEB) than the educated women. This observation was valid for all regions of Egypt at the two time points of the study. All the values of MCEB for the uneducated women as well as the educated women achieved a reduction during the study period, except for the uneducated in RU. The highest reduction in the MCEB occurred among educated women in RL. The least reduction for educated women was in UG. The highest impact of education on the MCEB occurred among women in Upper Egypt, in 2000. The least impact of education on MCEB in 2000 occurred among women in UG and UL.

Wives of uneducated Husbands have higher mean children ever born (MCEB) than wives of the second (educated) group. This observation was valid for all regions of Egypt at the two time points of the study. All the values of MCEB achieved a reduction during the study period, except for wives of uneducated husbands in RU. The highest reduction in the MCEB occurred among women of educated husbands in RL. The impact of education on MCEB was higher in 2000 than in 1980. This observation was valid for all regions of Egypt except in UL.

Woman's work experience before marriage had a negative impact on her CEB. The absolute difference between the two mean of CEB among working and not working women before marriage was about one child at the national level; it reached its highest level in UU in 1980 (about 2 children), and reached its lowest level in RU (about one fifth child) in 1980.

Analyzing the net effect on children ever born showed negative and significant effect of woman's age at first marriage in both 1980 and 2000. This observation was valid for all regions of Egypt. The highest coefficient of AFM in 1980 was in RL. It showed that a one-year increase in woman's age at first marriage would decrease, on average, her fertility by about one-fourth of a child, keeping other things constant. The highest coefficient in 2000 also was in RL. It showed a reduction in the fertility level by about one third of a child for one year increase in AAFM, keeping other things constant. The strength of the negative effect of woman's age at first marriage increased during the study period in all regions of Egypt; this result was not expected. Age at first marriage had and still has its impact on fertility.

Duration of breastfeeding has a negative and significant effect on fertility. This observation was valid for all regions of Egypt. The effect which is decreasing over time may be due to the decrease of child dependence on breastfeeding only.

Current age of woman has a positive and significant effect on fertility. This observation was valid for all regions of Egypt at the two time points of the study. The highest coefficient of CAW in 1980 was among the target women in UG. It showed that a one-year increase in woman's current age would increase, on average, her fertility by about one-fifth of a child in 1980, keeping other things constant. The corresponding coefficients in 2000 showed an increase in the fertility level by about one-third of a child, for one more year in a woman's age, keeping other things constant.

Wife's and husband's education has a negative effect on fertility. This observation was valid for all regions of Egypt with high level of

significance in almost all regions. It's noted that getting primary certificate had its effect on fertility in 1980, but the effect was less in 2000. i.e. having a primary certificate had less effect on fertility in 2000 than in 1980. Wife's education has its highest effect in RL, and husband's education has its highest effect in Lower Egypt.

Women's work status before marriage had a significant impact only in 2000. This is evident in all regions. It has its highest effect in Lower Egypt.

In urban Governorates the percentage of explanation of the models increased from about 51.3% in the base year of study, to about 78.3% in the comparable year. This trend was valid for all regions.

Direct Effect and its Trends on Proximate Variables

Analyzing the effect on proximate variables, the highest coefficient of wife's education in 1980 showed that having any education certificate would increase on average her AFM by about three years, keeping other things constant in UG. The corresponding coefficients in 2000 showed an increase in AFM by about two years in RL, keeping other things constant. In general, the effect of women's education on AFM is decreasing overtime.

The highest coefficient of woman's work experience before marriage, showed that woman's work before marriage would increase on average her AFM by about 3.3 years, keeping other things constant in RL in 2000. The effect of work experience on AFM is increasing overtime.

The coefficient of blood relation between couples reveals that there is a negative relation between blood relation and wife's AFM. This observation was significant and valid for all regions of Egypt at the two time points of the study. The effect of this observation was the highest in RL. The effect of blood relation on AFM is increasing overtime.

The net effects of wife's and husband's education (having a primary certificate or higher) on current use of contraceptives were significant at level 0.01 with higher odds 2 times compared to those who have less than primary certificate in UG in 1980. In UG, 2000 having a primary certificate for wives were not enough to have a significant effect on family planning practice.

Wife's work status was accompanied by insignificant increase in current use of contraception in 1980 and 2000 in UG.

The model is correctly classified; 62% out of the total number of cases in 1980 and 57% in 2000.

Also the table illustrates that the effects of wife's and husbands education who have a primary certificate or higher were significant at level 0.01 with higher odds 2 times compared to those who have less than primary certificate in UU in 1980, but the effect of wife's and husband's education is less than 2 times compared to those who have less than primary certificate in UU in 2000. Wife's work status in UU was accompanied by insignificant increase in current use of contraception in 1980 and 2000.

The model is correctly classified, 70% and 56% out of the total number of cases in 1980 and 2000 respectively.

Also the table illustrates that the effects of wife's and husbands education who have a primary certificate or higher in Egypt as a whole are significant at level 0.01% with higher odds 3 and 2 times respectively compared to those who have less than primary certificate. But obtaining a primary certificate for wife and husband have less odds ratio in 2000 than in 1980. Wife's work status is accompanied by significant increase in current use of contraception and probability of increasing CUSE about 57% in 2000. The model is correctly classified, 73% out of the total number of cases in 1980 and 56% in 2000,while the model fails to classify UL, RL and RU regions.

5.2 ***Recommendations:-***

According to the results of this study the following policy implications can emerge:-

- Fertility policies in Egypt should be designed at a regional level, that is region-specific policies and programs need to be formulated for RU, and more effort is needed to increase family planning practice

- More effort is needed to expand female education and provide more opportunities for female participation in employment especially in rural areas of Egypt.

- More efforts must be dedicated to comfort longer and more pressure breastfeeding practice, particularly among young women and those in urban areas, and to intensify the importance of breastfeeding for child health, and its importance as a complementary method of contraceptive.

- More attention needs to be given to the socio-economic development in RU Egypt in the long run. In the short run, mass media programs may have witty urgent effect in supporting the level of contraceptive use and the knowledge regarding expanding use of contraception, with their possible impact on reducing fertility.

- All the inhabitants of RU with low level of development should have the method of limiting the size of their families available to them.

- More attention in family planning programms should be directed toward RU Egypt and illiterate women.

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